Vol. 931 Number 3

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PATENTS

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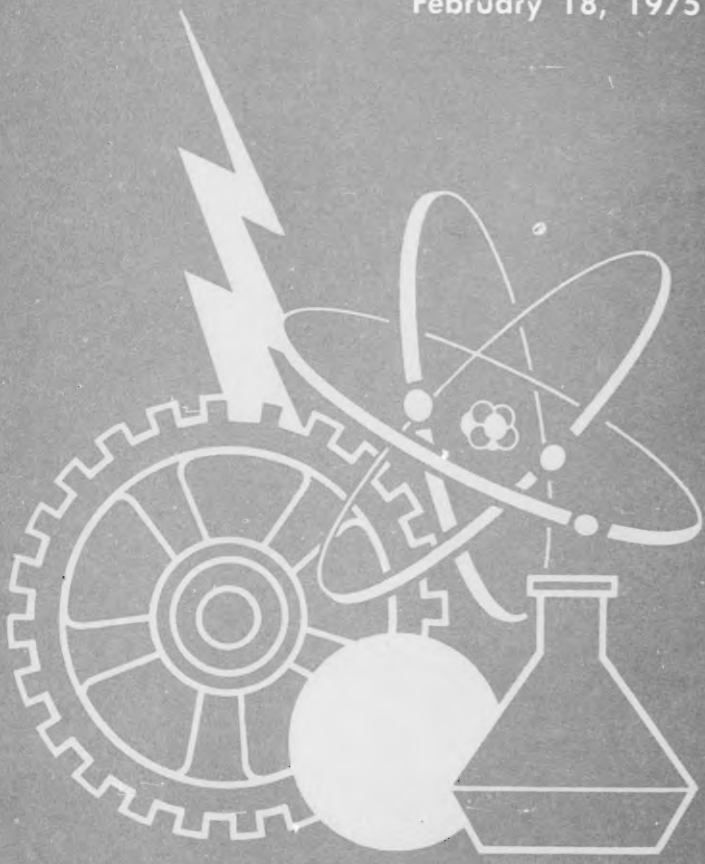

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February 18, 1975 Volume 931 Number 3

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PATENT OFFICE NOTICES

Certificates of Correction

New procedures for handling Certificates of Correction have been implemented to further expedite their issuance. Particular attention is directed to the following which specifically affect the patentee's input.

a. The form, PO–1050, which is used as the camera copy for printing the Certificate of Correction when approved, has been revised as a 2-part carbon interleaf set. Both parts of form PO–1050 must accompany the request, since the second part will be placed in the application file for internal use.

b. The practice set forth in the Notice of April 1, 1969, (862 O.G. 2) is hereby modified to the extent that copies of the request will not be returned when approved; therefore, the requirement for a self-addressed stamped envelope is withdrawn.

c. A perforated space at the bottom of form PO–1050 has been provided for the patentee's current mailing address, and for ordering any desired additional copies of the printed Certificate. The fee for each additional copy ordered after March 1, 1975, is $.30 per page. The fee should accompany the request.

d. Copies of the blank revised form, PO–1050, are now available and may be obtained without charge from the Correspondence and Mail Division and from the receptionist in Bldg. 3 in Crystal Plaza.

e. Where only a part of a request can be approved, or where the Office discovers and includes additional corrections, the appropriate alterations are made on the PO–1050 by the Office. The patentee is notified of the changes on Notification of Approval-in-Part, form POL–404. The Certificate is issued approximately 6 weeks thereafter.

To avoid delay in the issuance of Certificates, practitioners are urged to follow the suggestions below, which in most cases should require no additional expenditure in time.

1. The revised PO–1050 should be used exclusively regardless of the length or complexity of the subject matter. Intricate chemical formulas or pages of specification or drawings may be reproduced and mounted on a blank copy of PO–1050. Failure to use the form has frequently delayed issuance since the text must be retyped by the Office onto the PO–1050.
2. Identify on the request, the exact page and line number where the errors occur in the application file. On the PO–1050, however, the column and line number in the printed patent should be used as at present.
3. Retain the patent grant as specified in the Notice of March 18, 1969, (861 O.G. 680). The Office is no longer attaching the Certificate of Correction to patentee's copy of the patent. If submitted, the patent will be returned to the patentee.

Requests for Certificates of Correction will not be approved as a mattter of course under 37 CFR 1.323 (Rule 323) where the error complained of resulted from the filing of priority papers or assignment documents AFTER PAYMENT OF THE BASE ISSUE FEE. Please see M.P.E.P., Section 201.14(a) and 307, respectively.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.
Jan. 24, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,910,845, G. A. Wahlmark, CONSTANT VELOCITY JOINT, **filed** July 27, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1922, *Wahlmark Systems, Inc.* v. *SAAB-Scania of America, Inc.* By stipulation cause dismissed without prejudice, Nov. 26, 1973.

2,940,530, W. H. Du Shane, DRAFT LOAD CONTROL FOR TRACTORS, **filed** Apr. 5, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c22, *Deere & Co.* v. *Ford Motor Company and Belvidere Ford Tractor, Inc.* Case dismissed on plaintiff's motion with prejudice Aug. 7, 1972. **Same, filed** Apr. 5, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c852, *Deere & Co.* v. *International Harvester Co.* Case dismissed on agreement of parties without prejudice, June 3, 1974.

2,971,259, Hahnau and O'Toole, METHOD AND APPARATUS FOR DETERMINING THE POSITION OF SEWER LEAKS; **3,168,909,** Zurbrigen and Steinsberger, METHOD FOR LOCATING AND SEALING PIPE LEAKS, **filed** Aug. 22, 1974, D.C. Minn. (Minneapolis), Doc. 4–74–C 409, *Cherne Industrial, Inc.* v. *Penetryn International, Inc. and The Penetryn System, Inc.*

3,087,832, M. V. Fogle, TRANSFERABLE MAGNETIC COATING COMPOSITION AND TRANSFER WEB COATED THEREWITH, **filed** June 14, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1542, *The National Cash Register* v. *Allen Paper Co. et al.* By agreement case dismissed without prejudice, Oct. 5, 1973.

3,091,912, Stoddard and Seem, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, **filed** Jan. 21, 1971, D.C., S.D. Fla. (Miami), Doc. 71–83–C–CA, *Lex Tex Ltd. Inc.* v. *Universal Textured Yarns, Inc. and G. Allen Mebane.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Mar. 10, 1971, D.C., S.D. Fla. (Miami), Doc. 71–385–C–CA, *Lex Tex Ltd. Inc.* v. *Hialeah Knitting Mills, Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Mar. 10, 1971, D.C., S.D. Fla. (Miami), Doc. 71–386–C-CA, *Lex Tex Ltd. Inc.* v. *Universal Knitting Mills, Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Mar. 10, 1971, D.C., S.D. Fla. (Miami), Doc. 71–387–C–CA, *Lex Tex Ltd. Inc.* v. *Leumas Knitting Mills, Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 10, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1610–C–CA, *Lex Tex Ltd. Inc.* v. *Wayne Weavers Mills et al.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 10, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1612–C–CA, *Lex Tex Ltd. Inc.* v. *Reva Knitting Mills.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 10, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1613–C–CA, *Lex Tex Ltd. Inc.* v. *Alro Knits Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 10, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1614–C–CA, *Lex Tex Ltd. Inc.* v. *Jack Fried.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 12, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1630–C–CA, *Lex Tex Ltd. Inc.* v. *Richard J. Traub and Texfi Industries Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 17, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1656, *Lex Tex Ltd. Inc.* v. *Irwin Redmond.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 17, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1657–C–CA. Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 31, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1719–C–CA, *Lex Tex Ltd. Inc.* v. *Serbin Fashions Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Oct. 31, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1720–C–CA, *Lex Tex Ltd. Inc.* v. *Georgia Griffin Fashions, Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974. **Same, filed** Mar. 3, 1973, D.C., S.D. Fla. (Miami), Doc. 73–418–C–CA, *Lex Tex Ltd. Inc.* v. *Federated Department Stores, Inc.* Order of dismissal, complaint, *sua sponte,* is hereby dismissed, Aug. 29, 1974.

3,126,212, S. A. Young, COMBINATION GROUND JOINT AND SWEAT CONNECTION, **filed** Feb. 28, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–223, *Stephen A. Young* v. *Mansfield Sanitary, Inc.* Stipulation and order dismissing case with prejudice, Aug. 21, 1974.

3,155,814, Appleman and Eck, INFRARED RADIANT HEATING OVEN, **filed** Nov. 10, 1970, D.C., S.D.N.Y., Doc. 70–C–4916, *Alfon A. Wolz and Radiant Oven Corp.* v. *Litton Industries, Inc.* Stipulation of dismissal, May 18, 1971.

3,168,909. (See 2,971,259.)

3,184,893, W. S. Booth, CONTACT FOUNDATION METHOD, **filed** Feb. 18, 1970, D.C., S.D.N.Y., Doc. 70–C–660, *Contact Foundation Inc.* v. *M. Paquet & Co.* Filed plaintiff's voluntary dismissal, Aug. 28, 1972.

3,191,956, A. Rizzuto, WHEELED SHOPPING CART OR BASKET, **filed** Mar. 11, 1974, D.C., S.D.N.Y., Doc. 74–C–1127, *Bernard A. Guadano, Jr.* v. *Gertz, Abraham & Strauss, Bloomingdales, Inc., Macy, Sears and Roebuck and Times Sq. Stores.* Case transferred to Eastern District of New York, Apr. 11, 1974.

3,196,692, W. N. Jensen, SHAFT SUPPORT AND DAMPING MEANS FOR EDDY CURRENT INSTRUMENT, **filed** Jan. 5, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c62, *Stewart-Warner Corp.* v. *Yazaki Corp. and American Yazaki Corp.* Case dismissed without prejudice, Mar. 4, 1974.

3,221,781, B. G. Forsstrom, SAMPLE COLLECTOR, **filed** Mar. 24, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–628–WPG, *LKB Instruments, Inc.* v. *Marvin R. Solomon, etc. et al.* Order of dismissal—pursuant to Rule 41(a), it is hereby ordered that the remaining Count 2 of the plaintiff and the counterclaims of defendant Toyo be hereby and are dismissed with prejudice, Aug. 20, 1974.

3,349,732, Perrella and Picker, INDEXING APPARATUS FOR SEWING MACHINES, **filed** July 25, 1974, D.C., S.D.N.Y., Doc. 74–C–3199, *Dynacast Limited* v. *The Reece Corporation.*

3,424,479, Ditson and Cantrel, COUPLING AND ROD SYSTEM FOR ROCK DRILLS, **filed** Aug. 29, 1974, D.C., N.D. Ga. (Atlanta), Doc. C74–1745A, *Ingersoll-Rand Company* v. *Joy Manufacturing Company and Trax, Inc.*

3,504,907, Barber and Scrymgeour, FILING SYSTEM INDEX INDICATORS AND METHOD OF PRODUCING SAME, **filed** May 14, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1232, *Donald Barber and Thomas Scrymgeour-Toronto Canada and Datafile Limited* v. *Tab Product Co. and Tab Service Co.* Cause dismissed pursuant to Rule 41(a)(1) as to defendant Tab Service Co. only. Case still pending May 23, 1973, case dismissed Jan. 30, 1974.

3,580,982, J. B. Havewala, POLE RISER GUARD-BACK-UP PLATE COMBINATION, **filed** Jan. 18, 1974, D.C., W.D. Okla. (Oklahoma City), Doc. C–74–75–C, *Haskon, Inc.* v. *Indian Head, Inc.* Action dismissed without prejudice, Aug. 21, 1974.

3,621,961, K. Stumpf, UNIVERSAL ROLLER ASSEMBLY, **filed** Aug. 26, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV. 74–2481–FW, *Karl Stumpf* v. *Wheel Wrights, Inc.*

3,650,816, Rudy and Rapisarda, METHOD OF APPLYING ADJUVANTS TO CLOTH, **filed** Oct. 12, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2632, *A. E. Staley Mfg. Co.* v. *Lever Brothers Co.* Plaintiff's motion to dismiss under Rule 41(a) granted. Counterclaim dismissed without prejudice by consent of parties. Order of dismissal entered, May 22, 1974.

3,665,477, Budrow and Reed, ELEVATABLE AND FOLDABLE ANTENNA, **filed** Aug. 15, 1974, D.C., N.D. Ind. (South Bend), Doc. S74–174, *Barker Manufacturing Company, Inc.* v. *Cobra Industries, Inc.*

3,677,451, O. J. Burland, SUPPORTING BAR ASSEMBLY FOR VEHICLE, **filed** Aug. 29, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2487, *Oliver J. Burland* v. *Trippe Manufacturing Company.*

3,777,423, Coulter and Pearsall, CONDITION RESPONSIVE DOOR HOLDER-CLOSER, **filed** Aug. 13, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2297, *Rixson-Firemark, Inc.* v. *Republic Industries, Inc.*

3,785,163, W. Wagner, REFRIGERANT CHARGING MEANS AND METHOD, **filed** July 29, 1974, D.C., S.D. Fla. (Miami), Doc. 74–958–C–CF, *Watsco, Inc.* v. *Graves Refrigeration Co.*

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Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patent final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Reissue Patent No. 27,707, H. D. Kauffman, METHOD AND APPARATUS FOR DETECTING AND CONTROLLING THROUGH PULSE ENERGY VARIATIONS ARCING CONDITIONS IN AN EDM PROCESS, Interference No. 98,364, decided Oct. 3, 1974, claims 1, 2 and 7.

Patent No. 3,219,611, D. B. Witwer, AQUEOUS EMULSIONS OF VINYL AND VINYL AMINE COPOLYMERS, Interference No. 97,966, decided Nov. 6, 1974, the claim.

Patent No. 3,385,701, M. K. Ormsbee, R. E. Ormsbee and F. O. Bach, LITHOGRAPHIC OFFSET MASTER AND METHOD, Interference No. 96,988, decided Oct. 27, 1972, claims 1, 4, 5, 7 and 10.

Patent No. 3,402,996, P. K. Maher and C. V. McDaniel, ION EXCHANGE OF CRYSTALLINE ZEOLITES, Interference No. 97,234, decided Sept. 11, 1974, claim 4.

Patent No. 3,450,787, W. L. Kehl and R. J. Rennard, Jr., DEHYDROGENATION PROCESS, Interference No. 97,358, decided Oct. 7, 1974, claims 1, 3, 5, 7, 8 and 10–13.

Patent No. 3,533,927, E. J. Manning, SPARK ANTICIPATOR CIRCUIT FOR ELECTROCHEMICAL DEVICES, Interference No. 98,423, decided Oct. 18, 1974, claims 1, 2, 4, 5 and 9.

Patent No. 3,535,870, H. B. Mitchell, PARKING METER CONTROLLER, Interference No. 98,629, decided Nov. 29, 1974, claims 1–6 and 11–13.

Patent No. 3,551,383, J. C. Fang, AROMATIC POLYAMIDE-ESTERS AND A PROCESS FOR PREPARING THEM, Interference No. 98,577, decided Oct. 31, 1974, claim 1.

Patent No. 3,565,904, P. F. Juby, R. A. Partyka and T. W. Hudyma, 1,2,3,4-TETRAHYDRO-1-NAPHTHOIC ACIDS, Interference No. 98,096, decided Nov. 13, 1974, claims 1–6, 10, 13–15 and 19.

Patent No. 3,609,707, J. D. Lewis and A. H. Adelman, METHOD AND APPARATUS FOR GENERATING THREE-DIMENSIONAL PATTERNS, Interference No. 98,660, decided Nov. 13, 1974, claims 1–6, 8, 11–18, 20, 21, 23, 29–31 and 34–39.

Patent No. 3,731,472, I. Kamlukin, ROTARY MOWER SPINDLE BRAKE, Interference No. 98,644, decided Oct. 22, 1974, claim 3.

Patent No. 3,731,827, R. S. Eaves, LOGGING MACHINE, Interference No. 98,651, decided Oct. 9, 1974, claim 1.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 2, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-6-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-2-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-6-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-17-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	6-26-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-30-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Tesing; Indicating.	7-1-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-20-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-10-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-20-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-1-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-23-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-25-74

Expiration of patents: The patents within the range of numbers indicated below expire during February 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,821,713 to 2,825,063, inclusive
Plant Patents..... Numbers 1,677 to 1,685, inclusive

REISSUE PATENTS

GRANTED FEBRUARY 18, 1975

ERRATA

For CLASS	See PATENT NO.
220-358	28,342
208-120	28,341

REISSUES

FEBRUARY 18, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,339

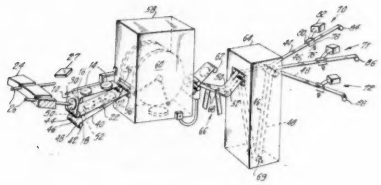
ANALYSIS ARRANGEMENT FOR MULTIPLE ANALYSES OF A SINGLE SAMPLE

Theodore Maxon, Elmhurst, N.Y., assignor to Automated Analyzers, Inc., Mineola, N.Y.

Original No. 3,607,090, dated Sept. 21, 1971, Ser. No. 863,943, Oct. 6, 1969. Application for reissue May 11, 1973, Ser. No. 359,488

Int. Cl. G01n *1/00, 1/28, 21/00*

U.S. Cl. 23—253 R **23 Claims**



1. An analysis system for performing a plurality of analyses on a single liquid sample, comprising:

a liquid sample receiving, holding and transferring strip medium, which includes at least one means for receiving and holding a single sample dispensed to it;

an analyzing strip medium which is adapted to receive liquid sample transferred to it for being analyzed on said analyzing strip medium;

said analyzing medium being so positioned with respect to said at least one sample receiving and holding means as to have sample transferred to it from said at least one receiving and holding means;

said analyzing strip medium being divided into a plurality of discrete portions; *said receiving and holding means being adapted to transfer in a single operation its sample contents to said analyzing medium;* at least a first [plurality] *group of* [which] *said portions in said plurality* are positioned and adapted to have a single liquid sample *simultaneously* transferred *from said at least one sample receiving and holding means to the said discrete portions in that said group* [to them] and are adapted to have the sample thereon react with a reagent to produce measurable reaction;

whereby a plurality of discrete analysis operations may be performed [on] *using* a single liquid sample which [is] *has been* transferred *in a single transfer operation* to said first [plurality] *group* of discrete portions of said analyzing medium *from said at least one sample receiving and holding means.*

28,340

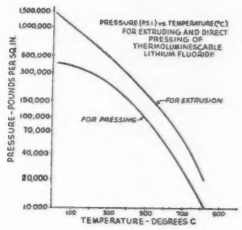
THERMOLUMINESCENT RADIATION PELLETS

Elmer C. Stewart, Highland Heights, and William S. Foulks, Jr., Chagrin Falls, Ohio, assignors to Kewanee Oil Company, Bryn Mawr, Pa.

Original No. 3,532,777, dated Oct. 6, 1970, Ser. No. 574,227, Aug. 22, 1966. Application for reissue Oct. 5, 1972, Ser. No. 295,285

Int. Cl. C09k *1/00*

U.S. Cl. 264—21 **9 Claims**



1. A process for preparing pellets adapted to be made thermoluminescent upon exposure to radiation comprising the step *either* of pressing *or extruding* a powder of a thermoluminescable material at a pressure of at least 10,000 p.s.i. while at a temperature of at least room temperature and no higher than 825° C., said pressure being [at least 400,000 p.s.i. when said temperature is in the range of room temperature to 100° C., at least 300,000 p.s.i. when said temperature is in the range of 100° to 200° C., and at least 200,000 p.s.i. when in the range of 200–300° C.] *less than 1.5 million p.s.i., greater pressures being required at lower temperatures.*

28,341

CATALYTIC COMPOSITION OF A CRYSTALLINE ZEOLITE

Robert L. Wadlinger, Niagara, N.Y., and George T. Kerr, Trenton, and Edward J. Rosinski, Deptford, N.J., assignors to Mobil Oil Corporation

No Drawing. Original No. 3,308,069, dated Mar. 7, 1967, Ser. No. 364,316, May 1, 1964. Application for reissue Mar. 4, 1969, Ser. No. 806,753

Int. Cl. B01j *11/40;* **C10g** *11/04*

U.S. Cl. 208—120 **17 Claims**

2. A crystalline synthetic catalyst material having the composition:

$$\left[\frac{X}{n}M(1 \pm 0.1 - X)H\right]AlO_2.YSiO_2.WH_2O$$

where X is less than 1, Y is greater than 5 but less than 100, W is up to about 4, M is a metal, and n is the valence of M, said material being characterized by an X-ray powder diffraction pattern essentially the same as that shown in Table 4.

15. In a process for conducting in the presence of a solid porous catalyst a hydrocarbon conversion reaction

characterized by a heat of reaction not less than zero, the improvement which comprises contacting charge hydrocarbons for said reaction at conversion conditions with a crystalline aluminosilicate catalyst at least partially in the hydrogen form resulting from treatment of the zeolite defined in claim 2 with a fluid medium containing ions selected from the group consisting of hydrogen ions and ammonium ions.

28,342

PRECOATED PLUG

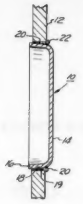
Tull C. Lasswell, 230 Pawnee Path, Lake Orion, Mich. 48035, and John L. Monier, 1968 Harwood Drive, Oxford, Mich. 48051

Original No. 3,635,369, dated Jan. 18, 1972, Ser. No. 851,261, Aug. 19, 1969. Application for reissue Aug. 3, 1973, Ser. No. 28,342

Int. Cl. B65d *41/00*

U.S. Cl. 220—358 **7 Claims**

1. A plug for closing an opening formed in a workpiece comprising a body member having a periphery of a shape which is complementary to that of said opening, and a plastic coating disposed on said periphery for creating a seal between said plug and said opening when said plug is



positioned therein, said plastic coating being comprised of a polyvinylidene chloride and a solvent selected from the group consisting of methol-ethyl-ketone and cyclohexanone.

PATENTS

GRANTED FEBRUARY 18, 1975

ERRATA

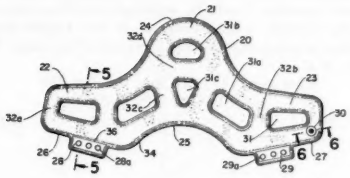
For CLASS	See PATENT NO.
034-001	3,866,255
219-137	3,866,284
046-022	3,866,348
156-017	3,866,398
072-337	3,866,471
015-050	3,866,541
273-044	3,866,691
292-092	3,866,730
173-073	3,866,746
277-009	3,866,813
240-007	3,866,840
215-341	3,866,845
290-038	3,866,960
211-069	3,866,992
358-010	3,867,010
148-001	3,867,196
148-175	3,867,202
148-187	3,867,203
148-188	3,867,204
162-016	3,867,246
360-126	3,867,368
191-012	3,867,590

PATENTS

GRANTED FEBRUARY 18, 1975

GENERAL AND MECHANICAL

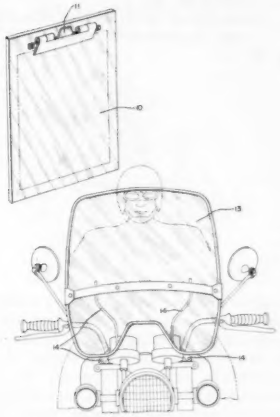
3,866,241
SHOULDER PAD CUSHION
Munro M. Grant, 3 Bluebell Ave., 212 Vanderbuilt Tower II, Naples, Fla. 33940
Filed Nov. 9, 1973, Ser. No. 414,347
Int. Cl. A41d *13/00*
U.S. Cl. 2—2 **6 Claims**



1. A modular, inflatable shoulder pad cushion for one shoulder adapted to be worn in readily detachable pairs for use underneath football shoulder pads, said cushion comprising skeletal, interconnected, relatively thin, narrow inflatable tubing forming a symmetrical medial portion for extending symmetrically in the fore and aft direction with respect to a wearer substantially over the top of one shoulder of the wearer; said medial portion having fore and aft, symmetrically formed cushion extensions for projecting over the chest and back of the wearer; said extensions comprising part of said skeletal tubing and being inwardly offset whereby inner edges of the extensions of a pair of said cushions worn on the shoulders of a wearer are disposed adjacent to each other; integrally formed lacing flats projecting from said inner edges for connecting a pair of cushions to each other at the extensions thereof; and inflating valve means provided at one point in said inflatable tubing.

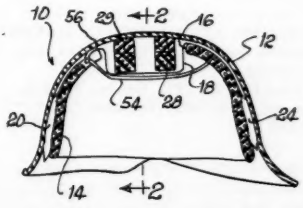
3,866,242
PROTECTIVE SHIELD
Edwin C. Slagel, Phoenix, Ariz., assignor to Goodyear Aerospace Corp., Akron, Ohio
Filed Oct. 27, 1972, Ser. No. 301,544
Int. Cl. F41h *1/02, 5/12*
U.S. Cl. 2—2.5 **6 Claims**

1. A safety shield consisting essentially of an optically clear polyurethane of about one-fourth to three-fourth inch thick, shaped in the contour of a shield and capable of stopping a 0.45 caliber 230 grain metal projectile fired at 90° obliquity at a distance of 2 feet from the shield, said polyurethane comprising the reaction product of (a) a polyurethane prepolymer prepared from either a polyether glycol or polyester glycol of about 700 to 1,000 molecular weight with methylene bis(cyclohexyl isocyanate) in the equivalent ratio of **2.7** to **4.5** NCO to each hydroxyl and (b) an aromatic amine curing agent having a methylene bridge between two aromatic rings to achieve an equivalent ratio of **0.90** to **1.04** NH_2/1.0 NCO.



6. The safety shield of claim **1** wherein the shield has the contour of a face mask.

3,866,243
HEADGEAR WITH AUTOMATIC SIZING MEANS
Gerard E. Morgan, Lake Forest, Ill., assignor to Riddell Inc., Chicago, Ill.
Filed Oct. 15, 1973, Ser. No. 406,625
Int. Cl. A42b *3/02*
U.S. Cl. 2—3 R **28 Claims**



1. In a headgear construction comprising a shell, and fitting means within the shell for engagement with the head of the wearer, the improvement wherein said fitting means comprises at least one chamber, a source of compressible fluid, means interconnecting said source and said chamber, said interconnecting means including a first means permitting passage of said fluid from said source to said chamber, and a second means permitting passage of said fluid from said chamber to said source, means engageable by the head of the

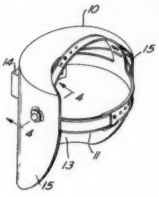
wearer upon placement of the headgear on the head operating to transfer said fluid through said first means from said source to said chamber whereby the dimensions of the head receiving space within the helmet will vary, and means for restricting operation of said second means upon placement of the headgear on the head to restrict passage of said fluid back to said source to thereby substantially maintain the variation in size change while the headgear is in place on the head.

3,866,244

HEADGEAR STRUCTURE FOR WELDING HELMETS AND THE LIKE

Heinz E. Ruck, Morton, Pa., assignor to The Fibre-Metal Products Co., Concordville, Pa.

Filed Nov. 8, 1973, Ser. No. 414,165
Int. Cl. A61f *9/00;* **A41d** *13/00*
U.S. Cl. 2—8 **8 Claims**



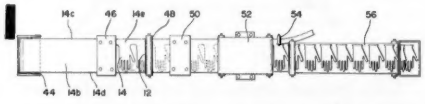
1. A headgear structure for supporting a welding helmet and comprising a headband for circumposition about a wearer's head, a bridge piece extending between spaced regions of said headband for extension across the wearer's head, a pair of elongate extensions located on opposite sides of said headband and each looped outwardly and upwardly with its terminal portion proximate to the adjacent region of said bridge piece, securing mens securing said terminal portions of said extensions to said bridge piece, and pivot mens extending through the outer portion of each looped extension for rotatively supporting a welding helmet, said headband and bridge piece and extensions being integrally fabricated of plastic, said securing means detachably securing said terminal portions to said bridge piece, said extensions being flexible to lie sustantially flat and coplanar with said headband and bridge piece in nonuse condition, said extensions each comprising an outstanding portion hingedly connected to a lower adjacent region of said headband, an upstanding portion hingedly connected to and upstanding from the outer extremity of said outstanding portion, and an inwardly extending portion hingedly connected to and extending inwardly from the upper extremity of said upstanding portion to said terminal portion.

3,866,245

PLASTIC GLOVES AND METHOD OF MAKING SAME

Donald Robinson Sutherland, 315 Forman Ave., Toronto, Ontario, Canada

Filed Dec. 22, 1972, Ser. No. 317,826
Int. Cl. B32b *31/18;* **A41d** *19/00*
U.S. Cl. 2—169 **11 Claims**



1. A method of manufacturing a glove comprising the steps of

a. forming a two-ply liner web consisting of a two-ply longitudinally extending portion and a plurality of two-ply hand shaped portions, each of said hand shaped portions having distinct finger portions and a cuff portion, each of said cuff portions being integrally connected to a ply of said longitudinally extending portion such that said hand portions project laterally from said longitudinally extending portions at spaced intervals along the length thereof,

b. interposing said two-ply liner web between overlapping films of thermoplastic material and bonding said overlapping films of thermoplastic material to one another along a seal line disposed outwardly from the edges of said hand shaped portion to form a laminate, and

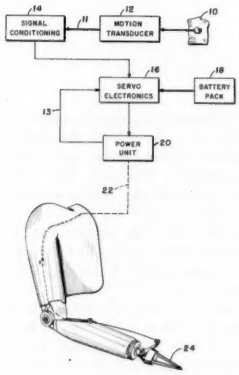
c. detaching individual lined gloves from the remainder of said laminate by severing said films along a line spaced outwardly from said seal line and by severing said hand shaped portions of said liner from the longitudinally extending portion thereof along a line extending across said cuff portion.

3,866,246

SHOULDER DISARTICULATION PROSTHETIC SYSTEM

Woodrow Seamone, Rockville, and Gerhard Schmeisser, Gibson Island, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 14, 1972, Ser. No. 306,480
Int. Cl. A61f *1/00, 1/06*
U.S. Cl. 3—1.1 **7 Claims**



1. A control system for actuating a prosthesis from voluntary skin movement of a user, comprising:

a prosthesis;

displacement sensing means for measuring the amplitude of movement of a point on the skin of a user of the prosthesis, the sensing means comprising

a magnet,

connecting means joined to the magnet and adapted to be connected to a point on such user's skin, and

magnetic field sensitive means for sensing a change in the magnetic field on displacement of the magnet by motion of that point on such user's skin to which the connecting means is joined;

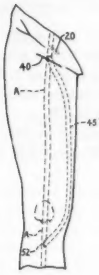
means for actuating said prosthesis in response to said sensed skin movement; and

means for providing a position feedback signal to said actuating means for identifying the degree of actuation imparted to said prosthesis.

3,866,247
GRAFT TUBES

Charles Howard Sparks, deceased, late of Portland, Oreg. (by Margaret J. Sparks, executrix)

Continuation of Ser. No. 241,190, April 5, 1972, abandoned, which is a division of Ser. No. 101,031, Dec. 23, 1970, Pat. No. 3,710,777, said Ser. No. 241,190, Continuation-in-part of Ser. No. 175,914, is a division of Ser. No. 823,287, May 9, 1969, Pat. No. 3,625,198, which is a continuation-in-part of Ser. No. 655,838, July 25, 1967, Pat. No. 3,514,791. This application June 18, 1973, Ser. No. 370,861
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **5 Claims**

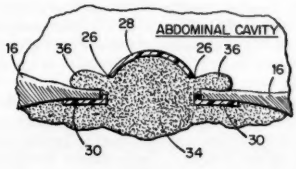


1. An autogenous graft tube comprising an ingrowth of connective tissue from a living body in the permanently implanted part of a mandrel assembly having a temporarily implanted part and a permanently implanted part, said temporarily implanted part comprising a flexible mandrel capable of bending with body movements, and said permanently implanted part comprising a fabric tube on said mandrel impregnated with a stiffening agent and a layer of material inside of said fabric tube holding said fabric tube spaced away from said mandrel, the entire outer surface of said fabric tube being exposed to said ingrowth of connective tissue, said ingrowth of connective tissue having a smooth cast lumen formed by said mandral, and said graft tube having a permanent blood supply established during the ingrowth of said connective tissue.

3,866,248
CEMENT RESTRICTOR FOR TOTAL HIP OPERATIONS

Frederick J. Kummer, Boston, Mass., assignor to Abcor, Inc., Cambridge, Mass.

Filed Apr. 8, 1974, Ser. No. 458,692
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **12 Claims**



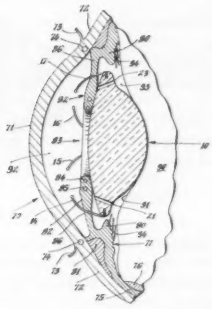
1. A cement restrictor device adapted for use in a hip replacement operation, which device comprises:

a raised cap-like upper element defining a cavity therein, the upper element having a continuous solid upper surface, the lower edge of the element adjoined to a peripheral lid element extending outwardly from the lower edge thereof, the lower crown portion of the cap-like element generally adjacent to the adjoinment to the lid element characterized by a plurality of peripheral passages therein to permit the passage of a cement material therethrough, whereby the upper element may be inserted into a hole in a bone of about the size of the upper element and cement applied to the interior cavity and forced through the passageway so as to lock the device between the lid element and the cement into the hole in the bone.

3,866,249
POSTERIOR CHAMBER ARTIFICIAL INTRAOCULAR LENS

Leonard Flom, Arlen Rd., Westport, Conn. 06880

Filed Mar. 7, 1974, Ser. No. 448,966
Int. Cl. A61f *1/16, 1/24*
U.S. Cl. 3—13 **28 Claims**

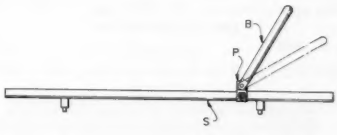


1. An artificial intraocular lens for implantation in the posterior chamber of an eye, the artificial intraocular lens comprising an optical zone portion fabricated of transparent material and shaped similar to a natural lens, and a plurality of prongs attached to the optical zone portion near the periphery thereof, the prongs protruding forwardly therefrom for insertion through the iris of the eye to hold and position the lens therein.

3,866,250
ADJUSTABLE BACK-REST

John Guythar Bradford, 47 Mansfield Dr., Ancaster, Ontario, Canada

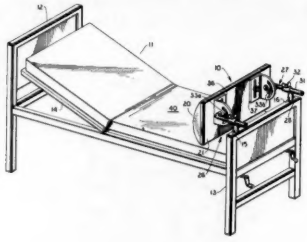
Filed Sept. 19, 1973, Ser. No. 398,595
Int. Cl. A61g *7/06*
U.S. Cl. 5—76 **8 Claims**



1. An adjustable back-rest for a stretcher comprising a substantially U-shaped tubular frame having a pair of side limb members joined by an upper cross bar, each said side limb member having at the lower end thereof a yoke member in the form of a pair of parallel, spaced ears with a slot therebetween, said ears being pivotally connected to a clamp member for connecting the back-rest to a stretcher, said clamp member having a projection extending into said slot, said projection having an arcuate face parallel to the pivot axis with said arcuate face having a series of spaced, radially extending holes, a locking pin mounted in each yoke member and being spring biased into engagement with one of said radial holes, said pins being connected together by a flexible cable member

which extends up within said side limbs and across between said side limbs through holes in the tubular walls with a portion of the cable between the side limbs being exposed as a loop, whereby both pins can be released from the holes to adjust the back-rest by pulling on said loop.

3,866,251
FOOTBOARD FOR HOSPITAL BED
R. Harold Pounds, 490 Manford Rd. S.W., Atlanta, Ga. 30310
Filed Nov. 24, 1973, Ser. No. 419,934
Int. Cl. A47c *21/00*
U.S. Cl. 5—327 R **7 Claims**



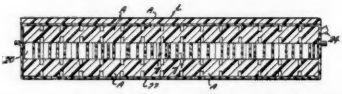
1. Adjustable footboard for use with a hospital bed having an existing pair of vertical receptacle apertures in laterally spaced apart relation with each other at the foot end of the bed, comprising:

an elongate foot engagement member of length sufficient to extend laterally substantially across the width of the bed; support means attached to said foot engagement member and extending rearwardly therefrom;

bed attachment means attached to said support means and extending downwardly at substantially a right angle to said support means, said bed attachment means including a pair of elongate members each of which is dimensioned to be slidingly received within said receptacle apertures provided in the foot of the bed; and

the lateral spacing between said elongate members being identical to said lateral spacing between said apertures.

3,866,252
RESILIENT SUPPORTING STRUCTURE FOR RELIEF OF PRESSURE
John E. Rogers, Jr., 3109 Grand Ave., Huntington Park, Calif. 90255
Continuation of Ser. No. 24,099, March 31, 1970, abandoned. This application Oct. 30, 1972, Ser. No. 301,724
Int. Cl. A47c *23/00*
U.S. Cl. 5—345 R **5 Claims**

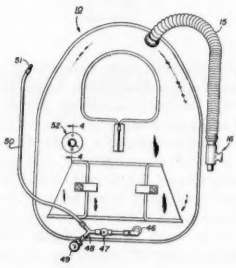


1. A cushion for effecting full surface contact with the peaks and valleys of the body portion of a patient situated thereabove to evenly distribute the weight of said patient on said cushion, said cushion comprising:

a. a resilient one-piece first sheet of a foamed resin that supports said patient, with the portion of said first sheet most adjacent said patient having a number of criss-cross grooves therein that subdivide said portion into a plurality of spaced segments that are independently movable relative to one another, and each of said sections having a height that is immediately responsive to the magnitude of the downward force exerted thereon; and

b. a second sheet of bitumen-impregnated foamed resin of substantial thickness on which said first sheet rests, with said second sheet when subjected to the weight of said patient that is transferred thereto through said first sheet slowly deforming to conform to the peaks and valleys of the portion of the patient's body supported by said first sheet, and the deformation of said second sheet being stabilized and completed when the weight of said patient is evenly distributed over said sections and said sections are in full surface contact with the peaks and valleys of the portion of the patient's body that rests on said first sheet.

3,866,253
DIVERS BUOYANCY VEST
Allen J. Sinks, Palatine; Gordon T. Shearer, Northbrook, and Vernon Pedersen, Chicago, all of Ill., assignors to Dacor Corporation, Northfield, Ill.
Filed Jan. 8, 1973, Ser. No. 321,963
Int. Cl. B63c *9/08*
U.S. Cl. 9—313 **8 Claims**



6. An inflatable safety vest for use by a scuba diver carrying a reservoir of compressed air for use in underwater breathing, said vest having a neck receiving opening, the improvement comprising

first and second separate and independent inflatable compartments in said vest,

a conduit including a manually operable valve connected between said first compartment and said reservoir for inflating only said first compartment from said reservoir with air,

a flexible conduit having a mouthpiece at one end and connected at the other end to said first compartment,

said flexible conduit being sufficiently long to permit the mouthpiece to be placed in the mouth of the diver wearing said vest,

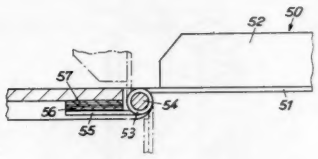
a manually operable valve connected in said flexible conduit for controlling the supply of air between said mouthpiece and said first compartment to permit said diver to orally inflate said first compartment and to breath air from said first compartment,

means including a CO_2 cartridge carried by said vest for inflating said second compartment only with CO_2 gas, and manually and automatically operated purge valve means carried at the front of said vest substantially below said neck receiving opening to release air from said first compartment upon manual actuation or when the pressure within said first compartment exceeds the ambient pressure by a predetermined value.

3,866,254
MACHINE FOR PERFORATING AND FOR BINDING SHEETS INTO A PLASTIC RING FOLDER

Delso Gronda, Via Medardo Rosso 16, I-20159, Milan, Italy

Filed Oct. 3, 1973, Ser. No. 402,910
Claims priority, application Italy, Oct. 16, 1972, 30521/72
Int. Cl. B42c *19/00*
U.S. Cl. 11—1 AC 9 Claims



1. A machine for perforating sheets and for enabling binding of said perforated sheets into a folder by engagement with a flexible plastic binding ring, said machine comprising, in combination:

perforation means including a plurality of punching elements for perforating said sheets, a longitudinal bar, slots defined at regular intervals along a lower face of said longitudinal bar, heads defined upon said punching elements and located to extend within said slots, a guide element for said punching elements arranged beneath said longitudinal bar, side guides for directing parallel displacement of said longitudinal bar, an eccentric cam, means mounting said eccentric cam above said longitudinal bar in a position for engagement therewith, a first lever for operating said eccentric cam, and a bridge element arranged above said longitudinal bar in fixed relationship therewith in a position to be contacted by said eccentric cam during operation thereof to enable raising of said punching elements, said eccentric cam having a cam profile adapted to engage said longitudinal bar and said bridge element to directly apply thereto by operation of said first lever forces to effect positive raising and lowering of said punching elements during perforation of said sheets;

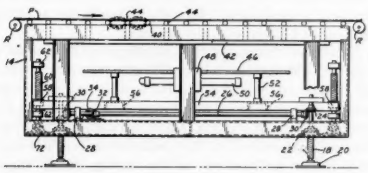
flexing means including a plurality of displaceable arm members adapted to engage said plastic ring to enable flexing thereof to a position where said perforated sheets may be placed in binding engagement therewith; and

a helical cam engaging said flexing means to effect engagement and flexing of said ring by said arm.

3,866,255
DIELECTRIC APPARATUS FOR AND METHOD OF TREATING TRAVELING PAPER WEBS AND THE LIKE

Rudolph M. Serota, East Cleveland, Ohio, assignor to Bangor Punta Operation, Inc., Bangor, Maine

Continuation-in-part of Ser. No. 385,130, July 27, 1964, abandoned. This application Oct. 21, 1965, Ser. No. 499,754
Int. Cl. F26b *3/34*
U.S. Cl. 34—1 15 Claims

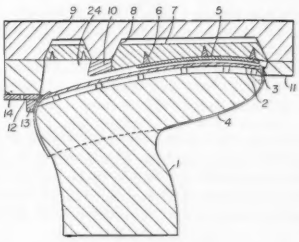


1. Apparatus for heating a traveling web of dielectric material comprising a grounded metal frame, means for vertically adjusting said frame, a source of radio frequency energy, a first capacitor plate mounted within said frame intermediate the top and bottom thereof, means independent of said first recited means for vertically adjusting said first capacitor plate relative to said frame, a second capacitor plate fixedly mounted on said movable frame above said first plate, a first series of horizontal electrode rods carried by said second capacitor plate above the latter and in electrical connection therewith, and a second series of parallel electrode rods interposed between and alternating with said first series of electrode rods but carried by and grounded to said frame, whereby when said web of dielectric material is caused to travel closely above said electrodes in a direction transversely of the latter and radio frequency current is applied to said movable capacitor plate, a voltage gradient and current flow will be established in the material in the regions between successive electrodes to heat such material.

3,866,256
METHOD OF MANUFACTURE OF SHOES

Anton I. Liebscher, Waynesville, N.C., assignor to Ro-Search, Incorporated, Waynesville, N.C.

Continuation-in-part of Ser. No. 78,530, Oct. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 43,394, June 4, 1970, abandoned. This application Jan. 18, 1973, Ser. No. 324,785
Int. Cl. A43d *9/00*
U.S. Cl. 12—142 RS 2 Claims



1. A method of manufacturing shoes comprising lasting an upper on a last, placing a split side frame which has a main portion and a heel portion against the peripheral margin of the upper, closing and thereby moving the side frame to exert inward pressure transverse to the sole of the last on the bottom margin of the side portion of the upper and moving the heel portion relative to the main portion and further exerting differential pressure on the heel portion of the upper lengthwise of the sole of the last.

3,866,257
SWIVEL TOP PAINT ROLLER WITH ADJUSTABLE HANDLE

William H. Cansdale, Sr., 183 N. 3rd St., Tecumseh, Nebr. 68450

Filed Dec. 26, 1973, Ser. No. 428,316
Int. Cl. B25g *3/38;* B44d *3/28;* F16b *7/12*
U.S. Cl. 15—230.11 3 Claims

1. A paint roller mechanism for supporting a paint roller at various angles relative to the axis of the handle and at various elevations relative to the level of the surface on which an individual using the same is standing such that ceilings and upper portions of walls may be readily painted without requiring the use of a ladder or the like, the mechanism comprising:

an axle adapted to have a cylindrical paint applying roller mounted thereon for rotation about its cylindrical axis, the ends of the axle projecting from opposite ends of the roller;

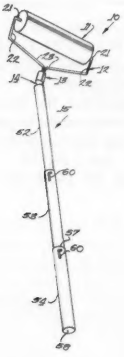
a pair of U-shaped bracket members each associated with one end of said axle and disposed in confronting relation-

ship with each other and each having one end secured to an associated end of said axle with the opposite end defining a free end extending in spaced relation to the side of the roller, said free end terminating in stem portions disposed adjacent to each other and extending generally normal to the axis of said axle and approximately centrally thereof;

a socket member having a top surface, side wall surfaces, and a bottom surface with said stem members mounted in said top surface and projecting substantially axially outwardly therefrom;

a recess including a spherical portion formed inwardly of said socket member and opening at said bottom surface thereof;

a spherical ball member rotatably retained in said spherical portion for rotation relative thereto;



a shank member having one end formed integrally with said ball member and projecting radially outwardly therefrom; a telescoping handle member having a top end connected to said projecting end of said shank member and having a bottom end spaced longitudinally from said top end; and

said recess including means cooperative with said ball and shank members for guiding a rocking swiveling movement of said roller relative to said handle axis in a plane defined by said handle axis and said axle axis whereby said roller is swivelable in opposite directions about said ball member within said plane of movement such that the handle member may be disposed at an angle to the roller axis with the roller surface still maintaining a continuous line of contact from end-to-end thereof with a surface being painted thereby.

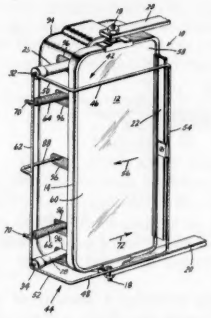
3,866,258

WIPER ASSEMBLY FOR SIDE-MOUNTED REAR VIEW MIRROR

Frank B. DeGraw, Rt. No. 1, Hudson, Ind. 46747

Filed Sept. 26, 1973, Ser. No. 400,845
Int. Cl. B60s *1/12, 1/44*
U.S. Cl. 15—250.29 **9 Claims**

1. In combination with a side-mounted rear view mirror assembly including a mirror having a front, reflective surface and a mounting frame therefor having a rear side, a wiper assembly comprising: a wiper blade disposed for transverse, linear movement across said mirror surface, at least one transversely extending fluid power cylinder mounted on said rear side of said mounting frame and having a piston and extensible piston rod, means connecting said piston rod to said wiper blade for maintaining the same in engagement with said mirror surface and moving said wiper blade transversely there-across in reciprocal fashion upon extension and retraction of said piston rod, a solenoid-actuated fluid valve on said rear side of said mounting frame coupled to said cylinder and adapted to be connected to a source of fluid under pressure whereby said piston and piston rod are extended in response to actuation of said valve thereby moving said wiper blade transversely across said mirror surface in one direction from one edge thereof to the other, spring means acting on said piston rod for returning the same to its retracted position thereby moving said wiper blade transversely across said mirror surface in the opposite



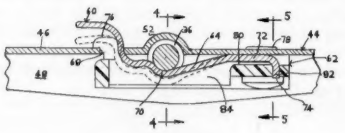
direction from said other edge thereof to said one edge, and means including a switch coupled to said solenoid and a linkage operatively connecting said piston rod to said switch for deactuating said valve responsive to substantially full extension of said piston rod thereby permitting said spring means to retract said piston rod and for again actuating said valve in response to substantially complete retraction of said piston rod.

3,866,259

WINDSHIELD WIPER BLADE CONNECTOR

Elton F. Nichols, Franklin, Mich.; John P. Moorhead, Palos Verdes Estates, Calif., and Leo J. Wubbe, Beverly Shores, Ind., assignors to The Anderson Company, Gary, Ind.

Filed Dec. 4, 1972, Ser. No. 312,209
Int. Cl. B60s *1/40*
U.S. Cl. 15—250.32 **3 Claims**



1. A windshield wiper blade assembly releasably mountable on the side of a wiper driving arm having a laterally extending pin with a reduced central portion between an enlarged outer end and an enlarged inner end comprising;

a. a pressure distributing wiper yoke member having a channel-shaped midportion with parallel sides having aligned apertures for receiving the enlarged ends of the laterally extending pin,

b. a mounting block secured in the channel-shaped midportion and having an aperture aligned with the apertures in the sides of the yoke member, and

c. a U-shaped spring member having parallel spaced apart legs with the free ends of said legs secured in the mounting block, midportions of said legs extending across the aperture in said mounting block and bearing on the reduced portion of the pin, and a connecting crosspiece at the opposite end of the legs adapted to be depressed for moving the midportions of the spring out of alignment with the apertures to release the pin for removal of the yoke and whereby the enlarged outer end of the pin may be positioned between said spaced apart legs with one leg

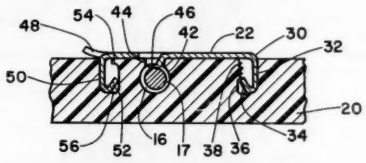
engaging in the reduced central portion of the pin to hold the blade on said driving arm.

3,866,260

LOW SILHOUETTE CONNECTOR FOR WINDSHIELD WIPER BLADES

Irwin C. Cone, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Oct. 17, 1973, Ser. No. 407,368
Int. Cl. B60s *1/40*
U.S. Cl. 15—250.32 **8 Claims**



1. In a windshield wiper assembly having an elastomeric squeegee wiping element, a squeegee-retaining backing member and a pressure-distributing superstructure engaging the backing member, said superstructure including a central molded plastic yoke member having a substantially flat top surface and a transverse opening therein releasably engageable with a wiper arm by a pin and clip assembly, the improvement comprising in combination therewith:

a substantially flat spring clip of a material having a modulus greater than the plastic of the yoke member, said clip attached to and closely engaging the top of the central yoke member forming a low silhouette connection therewith, the clip comprising:

a downturned retention portion securely and fixedly engaged in a receiving portion formed in the surface of the yoke member;

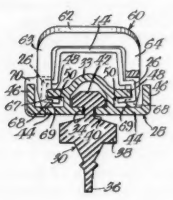
a lever portion spaced from the retention portion resiliently movable away from the upper surface of the yoke member while said retention portion remains fixed; and means intermediate said retention and lever portions of the clip protruding downwardly through a passageway into the opening in the yoke member for normal engagement with the pin, disengageable therewith upon displacement of said lever portion of the clip a predetermined distance away from the upper surface of the yoke member.

3,866,261

END CLIP FOR UNIVERSAL BLADE

Donald W. Stratton, Hammond, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Feb. 1, 1973, Ser. No. 328,648
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.42 **12 Claims**



1. A clip for holding a windshield wiper blade structure in assembled relationship on a superstructure, comprising:

a. an inverted U-shaped body of resiliently flexible material open at the opposite ends including

b. a relatively flat crosspiece with depending legs extending in parallel planes generaly normal to the crosspiece,

c. inwardly directed attaching means at the free ends of the legs extending toward each other,

d. free end portion of at least one leg having a retention means for embracing one claw of a superstructure, and

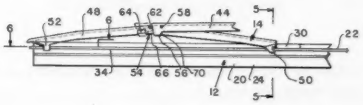
e. means at the free end of at least one leg for interlocking engagement with a blade structure.

3,866,262

WINDSHIELD WIPER BLADE

Leo J. Wubbe, Beverly Shores, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Oct. 16, 1973, Ser. No. 406,808
Int. Cl. B60s *1/38*
U.S. Cl. 15—250.42 **14 Claims**



1. A wiper for cleaning a windshield comprising a pressure-distributing superstructure operatively connected to a flexible backing strip carried by a resilient wiping member, a pair of abutments carried by said wiping member and positioned in spaced apart relationship thereon, said superstructure having a pair of secondary yokes and a primary yoke, each of said secondary yokes having means slidably engaging with one end portion of said backing strip outboard of the abutments, at least one of said secondary yokes having aligned indented portions formed intermediate the ends thereof, sidwardly projecting means formed inboard of said indented portions, stop means carried by said secondary yoke inboard of said projecting means, said primary yoke being pivotally connected to one said secondary yokes and having means on the other end portion which pass through said indented portion and pivotally engage with said projecting means and abut against said stop means, said abutments on said wiping blade urging said secondary yokes outboard relative to said primary yoke to hold the means on said primary yoke assembled with the projecting means on said secondary yoke whereby the superstructure is held assembled on the blade.

3,866,263

CLEANER WITH AUXILIARY AIR FLOW

Darwin S. Crouser, North Canton, and Joseph A. Powers, Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Apr. 17, 1973, Ser. No. 352,008
Int. Cl. A47l *9/22*
U.S. Cl. 15—412 **10 Claims**

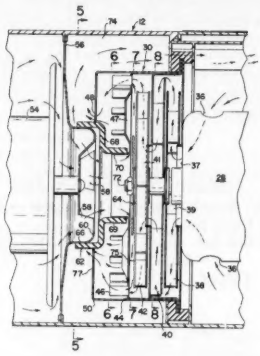
2. In a floor care appliance having an outer casing utilized for cleaning purposes;

a. a motor and motor-driven fan suction means for providing a suction flow of air through said motor and a pressure flow of air discharged from said motor-driven fan suction means;

b. said suction air moving through said motor for cooling thereof;

c. a secondary flow of air directly induced by said motor-driven fan suction means and discharged directly into said pressure flow of air immediately downstream of said motor-driven fan suction means and within a fan housing means which encapsulates said motor-driven fan suction means, and is spaced radially inwardly of said outer casing, and

d. said secondary flow of air being discharged into said pressure flow of air downstream of said motor means



whereby said secondary flow of air does not pass through said motor means.

3,866,264

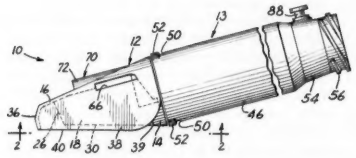
CLEANING DEVICE

Jan-Eric Engquist, Eskilstuna, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Continuation-in-part of Ser. No. 185,079, Sept. 30, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,657

Int. Cl. A47l *9/02*

U.S. Cl. 15—421 **9 Claims**



1. A cleaning device for cleaning a surface such as human skin and the like through the removal of excrement and semi-liquid matter from the surface by suction, said device comprising: body means including an inner core portion and an outer skirt portion; said inner core portion having side wall surfaces, front and rear ends, and a substantially flat lower surface; said inner core portion having a suction passage therein communicating with said front and rear ends thereof; said outer skirt portion being defined by a skirt wall which is connected at its upper edge to said inner core portion and which includes a portion spaced outwardly from said front end and side wall surfaces of said inner core portion to define an air channel between said inner core portion and said skirt wall; said skirt wall having edge surface portions adapted for engagement with the surface to be cleaned in a manner to maintain said flat surface of said inner core in spaced relation from the surface being cleaned; said skirt wall and said flat surface of said inner core portion defining an intake opening generally adjacent said rear end of said core portion for the entry of matter removed from the surface being cleaned when said device is disposed in an operating position; said skirt wall having at least one opening therein for the entry of breather air into said air channel; and means at said rear end of said inner core portion for connecting said suction passage to a source of vacuum such that material removed from the surface being cleaned is caused to pass through said suction passage toward the source of vacuum.

3,866,265

GLASS WASHING MACHINES

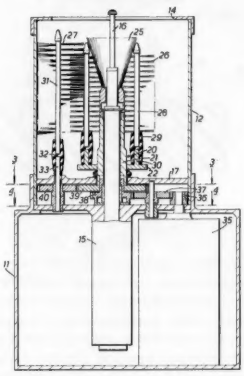
Rodney Thomas Beazley, Kent, England, assignor to Glassmaster Company Limited, London, England

Filed Aug. 16, 1973, Ser. No. 388,777

Claims priority, application Great Britain, Aug. 16, 1972, 38263/72

Int. Cl. A47l *15/38*

U.S. Cl. 15—75 **11 Claims**



1. A glass washing machine including,

a casing having an opening in its top wall to receive a glass, bottom upwards,

a retractable plunger projecting upwardly through the opening to engage the bottom of the inverted glass to be retracted by it, the plunger being vertically movable between a first position and a second position lower than the first position,

jet nozzles adapted to direct jets of liquid to impinge on the outside and inside of the glass.

brush-like means mounted within the casing or wiping the glass,

rinsing water supply means for supplying rinsing water,

washing solution supply means for supplying detergent or sterilising solution.

and valve means actuated by the plunger to connect the nozzles to the solution supply means when the plunger is adjacent its second position, and to the water supply means when the plunger is between its first and second positions,

whereby, as the plunger is lowered and raised between its first and second positions, the glass is subjected to a cycle comprising an initial rinse, a detergent and/or sterilising wash and a final rinse.

3,866,266

SELF-ADJUSTING DOCTOR BLADES

Harold E. Dunlap, Auburn, Mass., assignor to Lodding Engineering Corporation, Auburn, Mass.

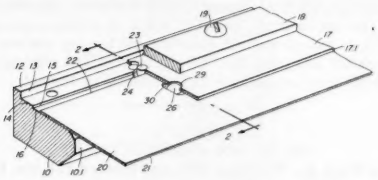
Filed Nov. 9, 1973, Ser. No. 414,196

Int. Cl. D21g *3/02*

U.S. Cl. 15—256.51 **10 Claims**

1. In combination, a generally planar elongated doctor blade having extending in the direction of elongation a forward edge for doctoring a surface in motion transverse to said direction relative to the blade and a back edge spaced from the forward edge by the width of the blade, and a holder for the blade comprising first and second spaced-apart members bounding an elongated blade-receiving space having a length substantially the same as the length of said blade, and a depth less than the width of the blade for receiving a first portion of the blade bounded by the back edge while a second portion of

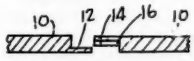
the blade bounded by the forward edge sticks out of the holder, throughout the length of both the holder and the blade, and means fixed in the blade-receiving space for stopping said back edge in a limited region intermediate the ends of the blade, said blade being free within prescribed limits to pivot in said holder around said stopping means.



3,866,267
RUGS WITH DETACHABLE SECTIONS

Genarose J. Poletti, Oakdale, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,074
Int. Cl. A47g *27/04;* **B32b** *7/06;* **A44b** *17/00;* **B32b** *3/10*
U.S. Cl. 16—8 **2 Claims**



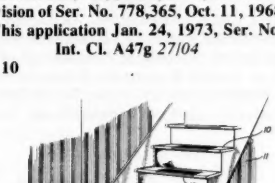
1. Apparatus for detachably interconnecting adjacent sections of rugs or carpeting having abutting peripheries to eliminate gaps, bulges and depressions, said apparatus comprising: a first type of velcro strip fastener secured to a peripheral edge of one section and extending outward and therealong, the bottom surface of the first fastener being horizontally aligned with the bottom surface of the section to which it is attached; and

a second and mating type of velcro strip fastener disposed in a recess in the abutting peripheral edge of the adjacent section, said recess extending inward from the edge and downward to the bottom surface of the adjacent section to overlie said first type fastener to enable both types of fasteners to be detachably engaged.

3,866,268
STAIR TREAD

Louis A. Cormier, 42 Central St., Southbridge, Mass. 01550

Division of Ser. No. 103,743, Jan. 4, 1971, Pat. No. 3,726,327, which is a division of Ser. No. 778,365, Oct. 11, 1968, Pat. No. 3,552,084. This application Jan. 24, 1973, Ser. No. 326,531
Int. Cl. A47g *27/04*
U.S. Cl. 16—10 **2 Claims**

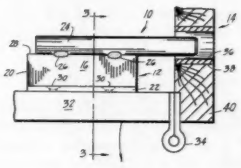


1. An insert for use in a recess in a stair tread, comprising a rectangular plate having parallel upper and lower surfaces and having the shape of the recess, the plate having four edges three of which form an acute angle with the lower surface and one of which forms a right angle with the lower surface, the two corners defined by the three edges and the lower surface are truncated to provide clearance at the corners.

3,866,269
DOOR SECURITY LOCK

Earnest C. Hudgins, 1050 N.W. First Ave., Boca Raton, Fla. 33432

Filed July 16, 1973, Ser. No. 379,420
Int. Cl. E05d *9/00*
U.S. Cl. 16—128 **4 Claims**



1. A security lock for a hinged door, comprising: a pair of separate interlocking members for separate attachment to a door and to a door jamb, respectively, one of said members having a fixed projecting pin and attachment receiving means for attaching said member to the hinged end of a hinged door, and the other member comprising an elongated tubular sleeve adapted to be received within a hole, in the door jamb to receive the end of said pin when the door is in its closed position, said one member including an angled support plate having at least two sections, each section disposed at 90° relative to an adjoining section, said pin being attached to one of said sections, and another section including said attachment receiving means, and a third section extending at a 90° angle from said pin carrying section and contacting the door when the said one of said interlocking members is secured thereto, whereby said third section serves as a reinforcing section for said pin carrying section, said third section lying in a plane disposed at right angles to said other sections.

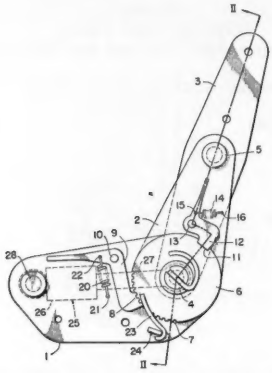
3,866,270
ADJUSTABLE HINGE FITTING FOR A SEAT WITH A MOVABLE BACK

Toshio Suzuki, Okazaki; Takami Terada, Toyota; Ryoichi Fukumoto, Nagoya, and Hisao Matsumoto, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Aichi Prefecture, Japan

Filed May 3, 1973, Ser. No. 356,747
Claims priority, application Japan, May 5, 1972, 47-4752621[U]
Int. Cl. E05d *11/10;* **B60r** *21/00*
U.S. Cl. 16—146 **4 Claims**

1. A two-part hinge arrangement for adjustably connecting a seat and a backrest, particularly for motor vehicles, comprising, in combination: a first arm fastened to the seat; a second arm; a third arm, said second and third arms being both pivotally connected together to said first arm by a first pin, said second and third arms being connected by a second pin providing a swivel axis against tilting of the back rest, said first pin having a portion of reduced strength between the sections of said first pin which are connected to said second and third arms; a sector gear loosely positioned on said first pin and having on its edge an arcuate series of teeth and a recess; a first handle-and-pawl pivoted on said first arm and having at its end a series of teeth for engaging the arcuate series of teeth on said sector; a second handle-and-pawl pivoted on said second arm for engaging said recess on said sector; torsion spring means to normally urge said sector toward rotation in a predetermined direction; and damper means pivotally connected at its one end to said first arm and at the opposite end

to said first pin to thereby resist angular movement of said third arm about said second pin, when said portion of reduced



strength of said first pin breaks while said second pin remains intact.

3,866,271

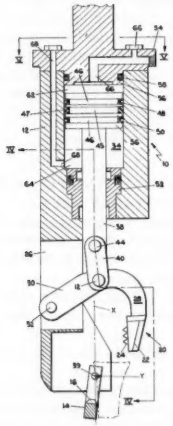
BONE HOLDING MECHANISM

Gary McNeil, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Oct. 26, 1971, Ser. No. 192,236

Int. Cl. A22c *17/04*

U.S. Cl. 17—1 G **12 Claims**



1. A bone holding apparatus comprising:

a base member;

a pair of jaws mounted on said base member; gripping means on each of said jaws adapted to hold said one end of a bone placed therebetween; one jaw of said pair being movable toward and away from the other jaw of said pair for forcing a bone against the gripping means of said other jaw of said pair thereby clamping said bone between said jaws; said other jaw of said pair being of a shape to encompass at least a portion of a bone held therein and being freely pivotally mounted on said base member relative to said one jaw of said pair, the pivotal mounting thereof being about an axis extending transverse to the direction of movement of said one jaw and through an area located between the two jaws permitting said other jaw to pivot to different positions locating the gripping means of said other jaw at differently spaced distances from a plane on which said axis is located and which extends generally in the same direction as the medial axis of said bones to be held therein, whereby said jaws automatically adjust to bones of varying sizes; and

driven actuator means for moving and forcing said one jaw toward said other jaw to thereby hold and restrain said bone from longitudinal and rotational movement.

3,866,272

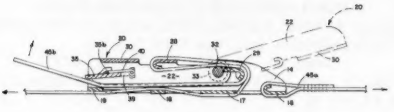
STRAP TENSIONING BUCKLE

Ernest Prete, Jr., Woodland Hills, and Howard T. Knox, Hawthorne, both of Calif., assignors to Ancra Corporation, El Segundo, Calif.

Filed May 20, 1974, Ser. No. 471,802

Int. Cl. A43c *11/00*

U.S. Cl. 24—68 CD **9 Claims**



1. A strap tensioning buckle comprising:

a frame member having a pair of substantially parallel side plates joined together by a plurality of cross bars,

a handle member pivotally attached to said frame member, said handle member having a pair of substantially parallel side plates joined together by a plurality of cross bars, said handle member being pivotally supported at one end thereof on said frame member,

a latch bar slidably mounted on said handle member at the end thereof opposite to said pivotally mounted end,

spring means for resiliently urging said latch bar outwardly away from the central portions of said handle member in a direction parallel to the longitudinal axes of the handle member side plates,

said frame member side plates having a pair of hook portions located near one end thereof and facing toward the center of the frame member, said latch bar fitting into said hook portions in engagement therewith with said handle in its latched position,

whereby said handle is released from its latched position by depressing said latch bar inwardly against the tension of said spring to disengage the latch bar from the hook portions.

3,866,273

WIRE CABLE ANCHORING ARRANGEMENT

Antonio Brandestini, Kusnacht; Hans-Rudolf Siegwart, Kilchberg, and Gerald Welbergen, Zumikon, all of Switzerland, assignors to Antonio Brandestini, Kusnacht, Switzerland

Filed Jan. 15, 1973, Ser. No. 323,658

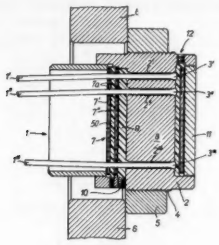
Claims priority, application Switzerland, Jan. 21, 1972, 929/72

Int. Cl. F16g *11/00*

U.S. Cl. 24—122.6 **2 Claims**

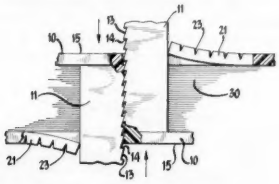
1. Wire cable anchoring arrangement for high dynamic loads, comprising a common anchoring body having bores therethrough, individual wires of a cable guided through said bores and anchored at their ends at said anchoring body, a supporting body of material softer than the wires provided at least at a wire outlet section of the bores of the anchoring body at a respective space between the wires and the walls of said bores, said supporting body bearing at the anchoring body and at the wires for taking-up the deflection forces to which the wires are exposed and for retaining the wires in a predetermined position relative to the anchoring body, and guide disk means disposed behind said anchoring body provided with

perforations corresponding to the bores of the anchoring body wherein the guide disk means consists of a double disk ar-



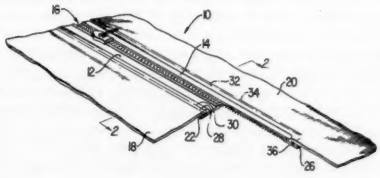
rangement and a sealing material arranged between both of the disks of the double disk arrangement.

3,866,274
DEVICE FOR BINDING SHEETS
Arthur J. Malavazos, Hayward, Calif., assignor to AJM Research Corporation, Hayward, Calif.
Filed Oct. 17, 1973, Ser. No. 407,239
Int. Cl. A44b *9/00*; B42f *3/00*
U.S. Cl. 24—153 **4 Claims**



1. A binding device comprising a pair of substantially identical members, each of which has a base, a plurality of spaced binding posts projecting from one side thereof, a series of ratchet teeth along the corresponding face of each of said binding posts, and an aperture in each base member adjacent each binding post along the edge thereof having the ratchet teeth, said aperture being of a size to barely permit the insertion therethrough of a binding post on a cooperating member, whereby the insertion of the binding posts through the aperture of the other of said members causes the base of each ratchet tooth to nest against the base of the other.

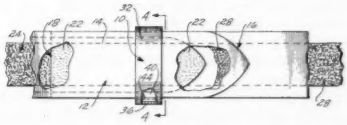
3,866,275
SLIDE FASTENER INSTALLATION
William F. Van Amburg, Meadville, Pa., assignor to Textron Inc., Providence, R.I.
Filed Apr. 12, 1973, Ser. No. 350,658
Int. Cl. A44b *19/34*, *19/00*
U.S. Cl. 24—205.16 D **7 Claims**



1. A slide fastener installation comprising:

a pair of fabric sections having edges disposed adjacent each other to define an opening therebetween;
a slide fastener having a pair of carrier tapes respectively engaging said fabric sections adjacent the edges;
said fabric sections and said carrier tapes being made of compatibly fusible materials;
said pair of carrier tapes having opposed ends facing each other at one end of the opening;
fused means securing each carrier tape to its corresponding fabric section adjacent the edge;
a fabric section along its edge having a transversely extending portion at the one end of the opening, the transversely extending portion including a tab folded thereunder and overlapping at least one end of the opposed ends of the carrier tapes; and said fused means securing the folded under tab to the one end of said carrier tapes.

3,866,276
SPRING-LOADED BELT KEEPER
Neale A. Perkins, Sierra Madre, Calif., assignor to Safariland Leather Products, Monrovia, Calif.
Filed June 11, 1973, Ser. No. 368,981
Int. Cl. A44b *21/00*
U.S. Cl. 24—259 A **4 Claims**



1. A removable keeper for clamping the overlying portions of one or more belts or the like, the keeper comprising an integral strip of resilient material including

an elongated front leg,
a top leg at one end of the front leg,
a bottom leg at the other end of the front leg,
the top leg and the bottom leg each extending transversely relative to and away from the same side of the front leg, the top and bottom legs having remove ends spaced laterally from the front leg,
an elongated latch-carrying leg at the remote end of the top leg extending transversely to the top leg and downwardly toward the bottom leg to a remote end spaced from the top leg, the length of the latch-carrying leg being a major portion of the length of the front leg,
an elongated detent-carrying leg at the remote end of the bottom leg extending transversely to the bottom leg and upwardly toward the top leg to a remote end spaced from the bottom leg,
a loop formed at the remote end of the latch-carrying leg and facing away from the front leg for providing a rounded, elongated latch member,
a loop formed at the remote end of the detent-carrying leg and facing toward the front leg for providing a rounded, elongated detent member having a rounded undersurface spaced above the bottom leg,
the latch member and detent member being positioned relative to each other so that the rounded surface of the latch member can be releasably engaged with the rounded undersurface of the detent member in a snap-fit, the latch-carrying leg being longer than the minimum distance between the detent member and the top leg, and being normally curved away from the front leg when the keeper is in its unlocked position such that when the latch member is engaged with the detent member in a snap-fit to lock the keeper, the latch-carrying leg is held in a position bowed inwardly toward the front leg to apply pressure to the overlying belt portions to which the keeper is applied.

3,866,277

METHOD OF SHRINKING CLOTH OR PAPER

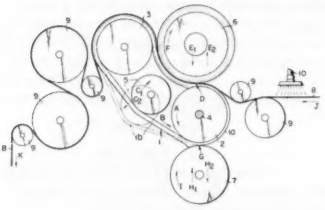
Iwajiro Hojyo, 30-13 Katsurahitsujisaru-cho, Kyoto, Japan

Filed Apr. 30, 1973, Ser. No. 355,935

Claims priority, application Japan, Dec. 13, 1972, 47-125067

Int. Cl. D06c *21/00*

U.S. Cl. 26—18.6 **3 Claims**



1. A method of shrinking a work material such as cloth or paper which comprises the step of:

a. providing an elastic endless rubber belt continuously driven only one way by driving means, said rubber belt having its thickness reduced when stretched;

b. providing upper and lower driven rollers such that they face each other across the driving means and endless rubber belt;

c. clamping the endless rubber belt by simultaneously shifting the upper and lower driven rollers toward two opposite clamping points on the periphery of the driving means with a relatively low and substantially equal pressure applied to the intervening endless rubber belt by cooperation of each of the upper and lower driven rollers with the driving means;

d. shifting and stretching one portion of the endless rubber belt defined between the two clamping points so as to let it have a smaller thickness than the other nonstretched portion of said belt before the rubber belt is driven;

e. continuously driving the rubber belt;

f. placing a work material on said one stretched and thinned portion of the endless rubber belt and conducting the work material to one clamping point together with said one stretched and thinned portion;

g. causing the other nonstretched portion of the endless rubber belt suddenly to contract itself immediately after said belt passes said one clamping point due to its thickness being increased by release from the stretching force applied to said one portion of said belt, thereby enabling the work material tightly attached to the surface of said other nonstretched portion to shrink to the same extent as the contraction of said other nonstretched portion; and

h. heating the work material thus treated so as to permanently set its shrunk form.

3,866,278

METHOD AND APPARATUS FOR THE CONCURRENT STRIPPING OF BOBBINS

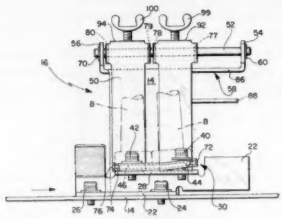
Gunter G. Golm, Providence, and Thomas Edgar Pitts, Cranston, both of R.I., assignors to Leesona Corporation, Warnick, R.I.

Filed Oct. 25, 1973, Ser. No. 409,582

Int. Cl. D03d *45/58*

U.S. Cl. 28—19 **10 Claims**

1. A stripping apparatus for the concurrent stripping of bobbins comprising, means defining a common path, means associated with said common path to urge bobbins therealong, means positioned relative to said common path to strip a first bobbin in said common path, and means positioned in said common path to tilt a second downstream bobbin in said common path adjacent said first bobbin in an upstream direction towards said first bobbin and relative to said stripping



means to enable the concurrent stripping of said first and said second bobbins by said stripping means.

3,866,279

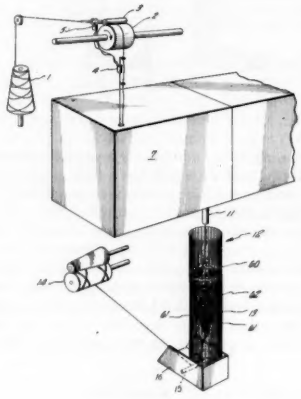
YARN PROCESSING APPARATUS AND PROCESS

Harry R. Kennedy, Greer, S.C., assignor to The Richen Co., Inc., Greenville, S.C.

Continuation of Ser. No. 255,399, May 22, 1972, abandoned, which is a continuation of Ser. No. 880,744, Nov. 28, 1969, abandoned. This application June 20, 1973, Ser. No. 371,890

Int. Cl. D02j *13/00;* **D06c** *1/00*

U.S. Cl. 28—62 **22 Claims**

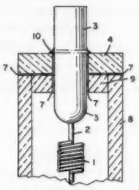


1. Yarn processing apparatus comprising a tubular convoluted conduit adapted to permit passage of yarn therethrough, a first nozzle connected to said tubular conduit having a passageway therein communicating with the entrance to said tubular conduit, means communicating with said passageway and said first nozzle to introduce air thereto, means associated with said air introduction means to heat air prior to introduction to said first nozzle, and a second nozzle connected to said tubular conduit at the exit end thereof, whereby yarn is permitted to pass through said first nozzle and said convoluted conduit in a substantially relaxed condition with radiant heat imparted thereto, said second nozzle comprising a first passageway communicating with said exit end of said tubular conduit, and means communicating with said second nozzle to admit cold air thereto to contact hot yarn passing through said second nozzle to provide for cooling of such yarn and for setting of the same while in a relaxed state.

3,866,280
METHOD OF MANUFACTURING HIGH PRESSURE SODIUM ARC DISCHARGE LAMP

Nikolaos Barakitis, Haverhill, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 26, 1973, Ser. No. 427,693
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.15 **5 Claims**

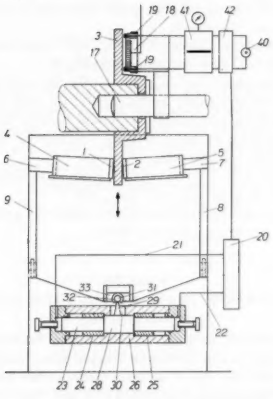


1. In the manufacture of a high pressure sodium arc discharge lamp, the steps comprising: inserting an electrode-bearing niobium tube through a hole in an alumina washer; disposing a glass-frit ring around the niobium tube; heating the frit ring to a first temperature sufficient to melt the glass and to thereby seal the niobium tube to the alumina washer; placing the tube-washer assembly on the end of an alumina arc tube which contains an interiorly disposed alumina insert sintered thereto, so that a capillary space exists between said insert and the niobium tube of said tube-washer assembly; and heating the assembly to a second temperature, higher than the first, sufficient to cause the previously melted glass to flow into said capillary space and to seal the assembly to the arc tube.

3,866,281
SURFACE SMOOTHING ARRANGEMENT

Bernhard Kunze, Erkelenz, Germany, assignor to Wilhelm Hengenscheidt GmbH, Erkelenz, Germany

Filed Sept. 10, 1973, Ser. No. 396,117
Int. Cl. B21c *37/30*
U.S. Cl. 29—90 R **5 Claims**

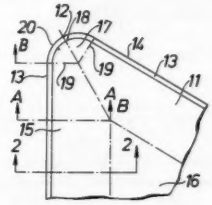


1. Surface smoothing arrangement, comprising mounting means for mounting a workpiece having opposite faces for rotation about a first axis transverse to said faces; a pair of smoothing rolls located on opposite sides of said workpiece in pressure-engagement with said faces and rotatable about second axes which are inclined at respective small angles to the same, and located in a common plane perpendicular to said faces; support means supporting said rolls for rotation about said second axes; pressure means for pressing said rolls against said faces; means for pivoting said rolls, support means, and pressure means jointly about a third axis which extends intermediate and parallel to said faces midway between points of contact between said rolls and said faces through an imaginary line connecting said points of contact and which also extends normal to said common plane; and measuring means for measuring any curvature of said faces and for correspondingly automatically actuating said pivoting means to the extent necessary for said rolls to smooth and remove such curvature.

3,866,282
CUTTING INSERT

Evert Gustav Lundgren, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Apr. 13, 1973, Ser. No. 351,012
Claims priority, application Sweden, May 17, 1972, 6419/72
Int. Cl. B26d *1/00*
U.S. Cl. 29—95 **1 Claim**

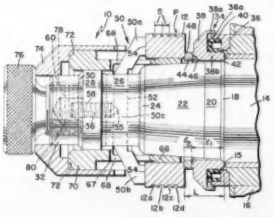


1. Cutting insert for chip-forming machining of metal work pieces, said insert having at least one cutting edge (**13**) formed of the transition between the major faces (**11**) and end faces (**14**) and a chip breaker groove (**15**) extending along the cutting edge (**13**) on the major or rake face (**11**), the mentioned end faces being connected by insert corners (**12**) provided with nose radius (**20**), in which cutting insert the cutter side of the chip breaker groove, seen in transverse cross-section, has an essentially straight profile, and in which the corner part (**17**) of the rake face is formed with a smaller rake angle γ than the remaining parts of the cutting edge (**13**), said rake angle γ decreasing continuously in the direction towards the insert corner (**12**) within a considerable transition zone which is at the most one-third of the total length of the side or edge of the cutting insert.

3,866,283
MULTI-GROOVE ROLL MOUNTING

David E. Gould, Oxford, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Dec. 26, 1973, Ser. No. 423,431
Int. Cl. B21b *27/02*
U.S. Cl. 29—121 R **6 Claims**



1. In a rolling mill, apparatus for mounting a multigroove work roll on the end section of a roll shaft in an operative position with one of the roll grooves in alignment with the mill pass line, said apparatus comprising: locating means on the roll shaft, spacer means positioned between and engageable at opposite ends respectively with said locating means and with

one end of a multi-groove work roll which is axially received on the roll shaft, and retaining means engageable with the roll shaft and with the other end of the work roll for holding the work roll against said spacer means in a fixed position on said shaft, said spacer means including at least one removable element, the presence or absence of which will change the axial length of the spacer means by a distance equal to the spacing between adjacent grooves on the work roll.

3,866,284

ONE-SIDE WELDING PROCESS

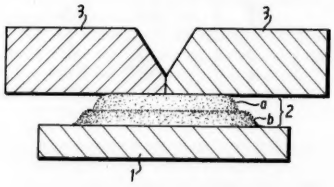
Masayasu Arikawa, Fujisawa; Motomi Kano, and Naoki Okuda, both of Kanagawa, all of Japan, assignors to Kobe Steel, Ltd., Fukiai-ku, Kobe, Japan

Division of Ser. No. 20,657, March 18, 1970, Pat. No. 3,721,797. This application Sept. 11, 1972, Ser. No. 287,851. The portion of the term of this patent subsequent to Dec. 22, 1988 has been disclaimed.

Claims priority, application Japan, Mar. 25, 1969, 44-22587; Dec. 4, 1969, 44-17458

Int. Cl. B23k *9/02*

U.S. Cl. 219—137 **1 Claim**



1. In a single-side arc welding process wherein a copper strip is used as the backing material for the workpieces intended to be joined, the improvement comprising:

applying a freely flowing granular flux material to a copper sheet to form at least one layer wherein at least 40 percent by weight, based on the total weight of the flux, is in a particulate form having a particle size of less than 840 μ, and whe ein said layer contains a granular binder material selected from the group consisting of thermosetting resin, fat, wax, paraffin, and a powdered glass having a softening point of not more than 1,000°C., which is fusible under the influence of the arc used in said welding process, applying said freely flowing granular flux binder layer to the side of said workpiece opposite said welding surface, and then conducting said single-side arc welding so as to fuse said granular binder to prevent displacement of said granular flux.

3,866,285

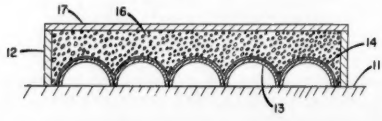
METHOD OF CONSTRUCTING A SOLAR ENERGY COLLECTOR

Harold A. Clark, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 1, 1974, Ser. No. 447,191

Int. Cl. B23p *17/00*

U.S. Cl. 29—157 R **5 Claims**



1. A method for manufacturing a solar energy collector comprising:

providing a flat base,

laying over said base a plurality of generally semicylindrical male mold portions in closely spaced parallel relationship,

placing a frame around said mold portions and extending upwardly from said base,

covering said male mold portions with a layer of foil shaped in conformity therewith,

pouring a curable foam plastic mix into said frame over said foil and curing said plastic mix,

removing the resultant composite of frame, plastic and foil from said male mold portions and base, and

providing solar energy receiving means within the recesses in said composite which were formed by said male mold portions.

3,866,286

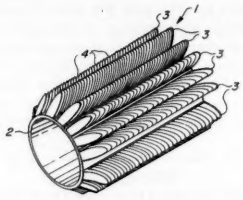
METHOD OF MAKING A FINNED TUBE HEAT EXCHANGER HAVING A CIRCULAR CROSS SECTION

Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Incorporated, Chicago, Ill.

Filed July 2, 1973, Ser. No. 375,764

Int. Cl. B21d *53/02*; **B23p** *15/26*

U.S. Cl. 29—157.3 A **11 Claims**



1. The method of making a heat transfer element comprising

a. forming an elongated tubular member having

1. a transverse width in one direction which is greater than the width thereof in the direction perpendicular to said one direction,

2. oppositely disposed outer wall portions extending along said first mentioned width, and

3. transversely spaced, outwardly projecting elongated ribs on the outer surfaces of said wall portions and extending longitudinally of said tubular member

b. successively, longitudinally of said tubular member, cutting fins from said ribs,

c. turning said fins outwardly into outwardly projecting relation to said wall portions, and

d. then expanding said tubular member into a more rounded transverse cross-sectional shape.

3,866,287

METHODS FOR THE MANUFACTURE OF SPRING ASSEMBLIES

Donald O. Dulude, and Paul H. Winbigler, both of Coldwater, Mich., assignors to Kuhlman Corporation, Lansing, Mich.

Division of Ser. No. 203,534, Dec. 1, 1971, Pat. No. 3,782,708. This application Feb. 13, 1973, Ser. No. 331,750

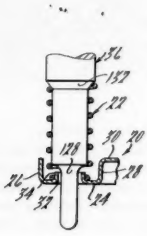
Int. Cl. B21f *35/00*; **B23p** *13/00*

U.S. Cl. 29—173 **37 Claims**

1. The method of manufacturing a spring assembly including a sheet metal base and a plurality of springs disposed on and extending in spaced parallelism from the base, which comprises the steps of individually securing the springs to the base to form a spring assembly, compressing said assembly between a pair of parallel electrodes with the base in engagement with one of the electrodes and with the projecting ends of all of the plurality of springs in engagement with the other

one of the electrodes, applying a voltage between the electrodes to flow current through all of the springs in parallel as well as through the base, and controlling the current so that each of the individual springs is resistance heated to stress relieving temperature while limiting the current to a value to prevent heating of the base to a damaging temperature.

3. The method of manufacturing a spring assembly including a base and a plurality of compression springs each having an end turn portion abutting and secured to the base and each extending in free spaced parallelism with the other springs from the base which comprises the steps of forming with a spring coiler from spring wire a plurality of separate individual



compression coil springs, said forming step including the steps of coiling the spring wire and severing the coiled spring, mechanically transferring the severed springs from the spring coiler to end-turn-portion abutting relationship with individual locations on the base, said transferring step including mechanically guiding each spring throughout its individual path from the spring coiler to its final location in abutment with the base, and directly securing only the abutting end turn portion of each of the transferred individual springs to the base with the remaining portion of each compression spring extending in free spaced parallelism with the other springs from the base.

3,866,288

ELECTROPLATED ISOTACTIC POLYPROPYLENE

Jean Claude Bernard, Le Meyran, and Pierre J. Pascal, rue Gerard Philippe, both of Martigues 13, France

Continuation of Ser. No. 49,965, June 25, 1970, abandoned. This application Feb. 20, 1973, Ser. No. 334,003
Claims priority, application France, July 1, 1969, 69.22101
Int. Cl. B23p *3/20;* **C23b** *5/64*
U.S. Cl. 29—195 **6 Claims**

1. An article formed of a polymeric material having a thin coating of a metal selected from the group consisting of nickel, chromium, combinations of nickel and chromium, gold and combinations of nickel and gold electroplated on one surface thereof after contacting said surface with an etching solution, a sensitizer, and an activator, said polymeric material being selected from the group consisting of a mixture of from 75 to 97% by weight isotactic polypropylene and 3 to 25% of an olefin copolymer having low crystallinity and a graft copolymer formed of 75 to 97% by weight of isotactic polypropylene onto which is grafted 3 to 25% by weight of a copolymer of ethylene and propylene containing more than 10% by weight ethylene, said polymeric material containing 0.1% to 2% by weight of at least one organic nitrogen derivative selected from the group consisting of amines and amides containing at least one aliphatic chain of at least six carbon atoms and at least one oxygen atom in the form of a group selected from the group consisting of a hydroxy group, an alkoxy group and an acyl group blended therewith.

3,866,289

MICRO-POROUS CHROMIUM ON NICKEL-COBALT DUPLEX COMPOSITE PLATES

Henry Brown, Huntington Woods; Thaddeus W. Tomaszewski, Dearborn, and Richard J. Clauss, Allen Park, all of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Continuation-in-part of Ser. Nos. 864,156, Oct. 6, 1969, abandoned, and Ser. No. 865,520, Oct. 10, 1969, abandoned. This application May 11, 1972, Ser. No. 252,495
Int. Cl. B32b *15/00;* **C23b** *5/50*
U.S. Cl. 29—194 **17 Claims**

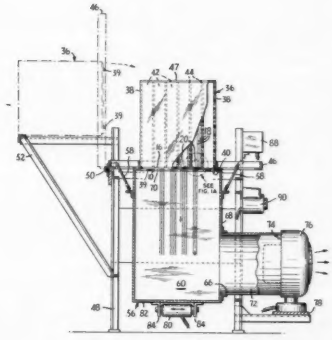
1. A firmly bonded laminated composite corrosion-protective metallic coating comprising as its essential layers three adjacently bonded layers of electrodeposits, the lower layer of which consists essentially of a metal selected from the class consisting of cobalt and cobalt-nickel alloy plate containing cobalt at least about 70% and having a thickness of about 0.1 mil to about 2 mils, an over-layer of metal selected from the class consisting of nickel and nickel-cobalt alloy plate containing at least about 50% nickel and having a thickness of about 0.02 to about 0.3 mil and an over-layer of densely porous chormium plate having a thickness of 0.005 to about 0.05 mil.

3,866,290

APPARATUS FOR INSERTING FIBERS INTO A SURFACE

John L. Norcross, c/o UMC Electropics, Inc., P.O. Box 3118, New Milford, Conn. 06810

Filed Apr. 23, 1973, Ser. No. 353,739
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 V **12 Claims**

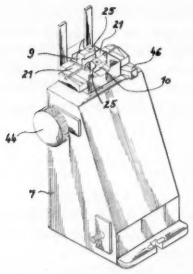


1. Apparatus for inserting fibers into a surface having a multiplicity of holes therein comprising a hopper for maintaining the fibers upright adjacent to and above the surface when the surface is generally horizontal, the hopper having side walls and an open bottom end, means for effecting relative movement between the fibers and the surface to move the fibers about the surface and thereby to cause the fibers to find the holes in the surface and be received therein, and means for maintaining the surface adjacent the bottom end of the hopper while relative movement is effected between the fibers and the surface.

3,866,291
APPARATUS FOR SPLICING CONDUCTORS

Helmut Heuser, Herdecke; Winfried Stupp, Hagen; Heinz Penz, Hagen; Walter Rose, Hagen, and Siegfried Muller, Breckerfeld, all of Germany, assignors to Walter Rose KG, Hagen, Germany

Filed July 16, 1973, Ser. No. 379,389
Claims priority, application Germany, Sept. 20, 1972, 2246151
Int. Cl. H01r 19/00
U.S. Cl. 29—203 DS 15 Claims



1. An apparatus for the solderless splicing of insulated electric conductors by means of a splicer which has a base and lateral walls to define a trough and in which the conductors are longitudinally coextensively positioned in opposite orientation, comprising in combination:

a. a jaw assembly having a length dimension and two ends; b. means defining backup supports, one situated adjacent and externally of each end of said jaw assembly;

c. a first conductor guide provided on both said backup supports, said first conductor guide having an axis passing through said jaw assembly and being coextensive with the length dimesion thereof;

d. a second conductor guide provided on both said backup supports in a side-by-side relationship with said first conductor guide, said second conductor guide having an axis passing through said jaw assembly and being coextensive with the length dimension thereof;

e. a first cutting means operatively coupled to said jaw assembly and disposed at one of its two ends, said first cutting means having a cutting zone extending approximately flush with said one end of said jaw assembly and intersecting the axis of said first conductor guide;

f. a second cutting means operatively coupled to said jaw assembly and disposed at the other of its two ends, said second cutting means having a cutting zone extending approximately flush with said other end of said jaw assembly and intersecting the axis of said second conductor guide;

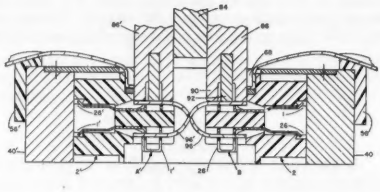
g. actuating means for operating said jaw assembly to bend the lateral walls of said splicer onto said base and simultaneously operating said first and second cutting means; and

h. pulling means coupled to said actuating means for drawing said conductors, extending through said jaw assembly, partially out of said splicer, said pulling means including means for moving said backup supports away from said jaw assembly parallel to the length dimension of said jaw assembly during the actuation thereof.

3,866,292
APPARATUS FOR CONNECTING CONDUCTORS TO TWO CONNECTORS WHICH ARE BACK TO BACK

John James Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 15, 1974, Ser. No. 442,941
Int. Cl. H01r 43/04
U.S. Cl. 29—203 MW 9 Claims



1. Apparatus for connecting the corresponding terminals in each of two identical electrical connectors to each other, said terminals in each of said two connectors being arranged in two parallel rows having wire-receiving portions which are adjacent to the rearward ends of said connectors, said apparatus comprising:

connector jig means for positioning said connectors in back-to-back relationship with corresponding ends of said connectors proximate to each other and with the said rows of each connector offset relative to the corresponding rows of the other connector,

wire locating means on said jig means for locating wires in alignment with said wire receiving portions of said terminals in each of said connectors,

fixed wire shearing means on said jig means having fixed shearing edges extending beside said rows, and

movable shearing and insertion means having movable shearing edges cooperable with said fixed shearing edges and having insertion punch means for inserting wires into said wire-receiving portions, said movable shearing and insertion means being movable towards and away from said connectors in said jig means whereby,

upon connecting the ends of wires to the wire receiving portions in the non-corresponding rows of said connectors, positioning said connectors in said jig means, dressing the wires from each of said connectors towards the other connector and positioning the dressed wires in alignment with the corresponding wire receiving portions of said terminals in the other connector by means of said wire locating means, and moving said movable shearing and inserting means towards said connectors, said wires will be sheared and inserted into said wire-receiving portions.

3,866,293
APPARATUS FOR ELECTRICALLY TERMINATING INSULATED CONDUCTORS IN INSULATION-PIERCING CONTACT PORTIONS OF AN ELECTRICAL CONNECTOR

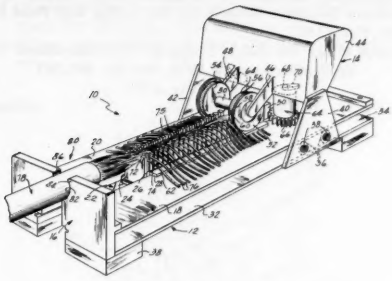
John Peter Nijman, West Hill, Ontario, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 1, 1973, Ser. No. 402,132
Int. Cl. H01r 43/04
U.S. Cl. 29—203 DT 24 Claims

1. An apparatus for terminating a plurality of free-ended, insulated electrical conductors to an electrical connector having rearwardly disposed opposite sides which support at least one row of generally parallel and aligned insulation-piercing contact portions, said apparatus comprising:

support means for supporting the electrical connector in a position to expose the aligned contact portions so that respective conductors may be positioned directly adjacent thereto;

insertion means for pressing the individual conductors into respective insulation-piercing contact portions, said insertion means comprising:



a rotatable member including a plurality of conductor insertion members disposed to sequentially enter the contact portions; and

carriage means for moving said rotatable member along the row of contact portions to sequentially terminate the conductors in the contact portions.

3,866,294

INSERTION TOOL FOR INSULATION PIERCING CONTACT

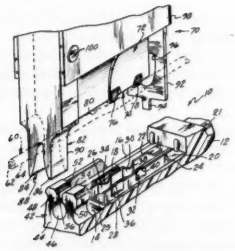
William Stephen McCaughey, East Petersburg, Pa., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 19, 1973, Ser. No. 407,779

Claims priority, application Japan, Oct. 19, 1972, 47-104019

Int. Cl. H01r *43/00*; **H05k** *13/00*

U.S. Cl. 29—203 H **23 Claims**



1. A tool for mounting an insulation covered electrical conductor in a contact member of a connector unit, the contact member having one end shaped to receive the free end of a conductor, being elongated and comprising at least one terminal flange with an insulation piercing notch disposed laterally across the contact spaced apart from the end portion and including an upper enlarged portion with upwardly diverging sides and a lower portion with narrow sides, said tool comprising:

conductor engaging means for pressing the conductor into the contact member and notch including

tool support means for receiving a conductor insertion force, and an insertion blade carried on said tool support means having a width less than the width of the upper portion of the channel for insertion therein, said insertion blade including an edge portion for engaging the conductor and projections extending from said edge portion in the direction of insertion and spaced for insertion between the sides of the insulation piercing notch, said projections shaped for entry into the lower portion of the contact member.

3,866,295

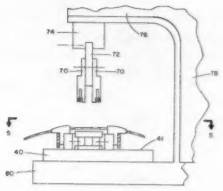
APPARATUS FOR CONNECTING CONDUCTORS TO WHICH ARE BACK TO BACK

John James Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 15, 1974, Ser. No. 442,959

Int. Cl. H01r *43/04*

U.S. Cl. 29—203 MW **5 Claims**



1. Apparatus for connecting wires to the wire receiving portions of electrical contact terminals, said terminals being contained in two electrical connectors, said contactreceiving portions being arranged in side-by-side relationship in a row in each of said connectors, said apparatus comprising:

a connector jig plate having connector locating means thereon for locating said two connectors adjacent to each other with said rows extending parallel to each other in spaced-apart relationship,

a wire locating jig, means for locating said wire locating jig on said connector jig plate in at least partially surrounding relationship to two connectors mounted on said connector jig plate and with portions of said wire locating jig extending beside each of said rows of contact terminals, in said connectors,

fixed wire shearing means having parallel spaced-apart fixed shear bars, means on said fixed shearing means for positioning said fixed shearing means on connectors mounted on said connector jig plate with said fixed shearing bars extending parallel to said rows of conductor-receiving portions of said contact terminals,

wire locating means on said wire locating jig for locating a plurality of wires in parallel side-by-side relationship with each wire being in alignment with corresponding terminals in each of said connectors, and

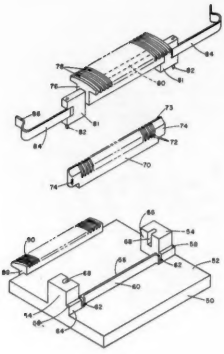
movable shearing and insertion means movable along a path extending towards said jig plate, said movable shearing and insertion means having movable shearing edges for cooperation with said fixed shearing edges and having inserting punches for inserting said wires, after trimming, into said contact terminals whereby,

upon positioning said connectors in back-to-back relationship on said connector jig plate, positioning said wire locating jig on said jig plate in at least partially surrounding relationship to said connectors, positioning said fixed shearing means on said connectors, locating wires in said wire locating means on said wire locating jig, and moving said movable shearing and insertion means along said path towards said jig plate, said wires will be sheared and portions of said wires extending between said connectors will be inserted into said contact terminals.

3,866,296
APPARATUS FOR CONNECTING CONDUCTORS TO TERMINALS IN CONNECTORS INTERMEDIATE THE ENDS OF THE CONDUCTORS

John James Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 15, 1974, Ser. No. 442,960
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 MW 5 Claims



1. Apparatus for connecting an intermediate portion of each of a plurality of wires to each of a plurality of electrical contact terminals, said terminals being arranged in first and second rows which extend parallel to each other and which are on oppositely facing sides of an electrical connector housing, said terminals having wire-receiving portions which are adapted to receive wires upon movement of said wires laterally of their axes and into said wire-receiving portions, said apparatus comprising:

a connector jig plate having a supporting surface and having connector locating means for locating said connector housing spaced from said supporting surface with said first row extending parallel to, and proximate to, said surface and with said second row remote from said surface, said locating means having recessed surface portions which provide clearance between said first row of contact terminals and said supporting surface,

a wire positioning comb comprising a bar-like member having a plurality of spaced-apart wire-receiving notches therein which is equal to the member of said contact terminals in one of said rows, said notches being spaced apart by distances equal to the spacing between said contact terminal in said rows,

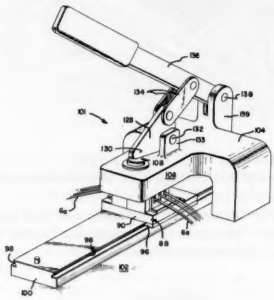
comb locating means for removably mounting said comb in alignment said second row of contact terminals in a housing mounted on said jig and in spaced relationship to said surface, and

wire inserting means for inserting wires into said terminals, said wire inserting means being movable along a predetermined path towards and away from said surface whereby, wires positioned in said wire positioning comb are inserted into said contact receiving portions of said second row upon movement of said inserting means towards said surface, and said connector can be reversed on said jig plate and wires can be inserted into said one row of terminals.

3,866,297
PRE-LOADED ELECTRICAL CONNECTORS, ASSEMBLY APPARATUS AND METHOD

Lionel Dennis Aldridge, 7635 Ridge, Seminole, Fla. 33540, and Edward Dennman Bunnell, Rt. No. 1, Box 448, Palm Harbor, Fla. 33563

Division of Ser. No. 321,505, Jan. 8, 1973, abandoned. This application July 24, 1974, Ser. No. 491,209
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 MW 8 Claims



1. Apparatus for electrically and mechanically connecting predetermined conductors to terminals in each of two multicontact electrical devices, each of said terminals having a conductor-receiving portion which is adapted to receive a conductor upon movement of said conductor laterally of its axis and into said conductor-receiving portion, said conductor receiving portions in each of said connectors being arranged in side-by-side relationship in a row, said apparatus comprising:

connector jig means for holding said connectors with said rows extending parallel to each other,

conductor inserting means cooperable with said conductor receiving portions of said terminals, movable along a predetermined path extending towards and away from said jig means,

conductor severing means being effective to sever conductors along first and second severing lines, each of said first and second severing lines extending adjacent to a separate row of wire receiving portions and between said rows, said severing means comprising fixed severing edge means defining said first and second severing lines and movable severing edge means movable past said fixed severing edge means, said movable severing edge means being movable with said inserting means whereby,

upon positioning said connectors in said jig means and upon locating said conductors with their axes extending across said rows of wire receiving portions and in alignment with said conductor receiving portions, and upon movement of said conductor inserting means towards said jig means, each of said conductors is inserted into the conductor-receiving slots of two corresponding terminals in said connectors, and the portion of each conductor extending between said wire receiving portions is severed from each of said conductors.

3,866,298
ASSEMBLY APPARATUS

Herman P. Nowak, Danvers, Mass., assignor to The Gillette Company, Boston, Mass.

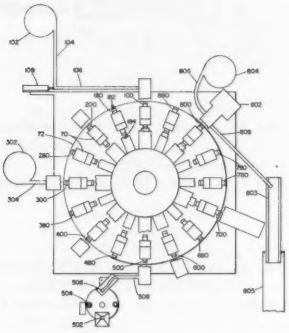
Filed Jan. 2, 1974, Ser. No. 429,846
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 F 47 Claims

1. Apparatus for assembling a razor of the type having a base structure that includes a back member and a blade cartridge mount carried transversely at one end of said back

member, and a handle adapted to overlie said back member, said handle and back member having mutually interlockable engagement means, comprising:

a plurality of nests, each of said nests having a back member support surface, cartridge mount support means, and means for clamping a base structure,

a station to load base structures one at a time onto said nests,



means to mount a handle in overlying vertical alignment with a loaded base structure,

a station to press a mounted handle downwardly into interlocking engagement with an underlying base structure,

a discharge station including means to disengage an assembled razor from a nest, and

means for moving said nests progressively from said base structure loading station, to said handle mounting means, to said pressing station, to said discharge station.

3,866,299

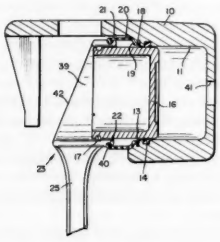
SEAL ASSEMBLY TOOL

Jack C. Gregg, Elwood, and Max D. White, Noblesville, both of Ind., assignors to G & D Tool Company, Inc., Elwood, Ind.

Filed Aug. 3, 1973, Ser. No. 386,286

Int. Cl. B23p *19/02*

U.S. Cl. 29—235 **1 Claim**



1. For use with a power disc brake cylinder having an open end with an inwardly-opening peripheral groove near said open end and spaced axially outwardly from said cylinder open end and partially obstructing access to said open end, an outboard shoe support bracket formed integrally with said cylinder, a piston for reciprocation in said cylinder and insertable through said open end, said piston being formed with an outwardly-opening peripheral groove near its proximal end, and a sealing gasket including an external peripheral bead at one end receivable in said first-named groove, and an internal peripheral bead at its other end receivable in said piston groove; the invention which consists of a pair of allochirally related bars, each having a handle portion and a distal portion, means pivotally connecting said bars together so that movement of said handle portions toward each other separates said distal portions, and each of said distal portions being part-circular and having a peripheral extent slightly less than 180° and being formed to provide an outwardly opening, peripherally coextensive groove for receiving said internal bead, means resiliently biasing said handle portions away from each other, and the inner surfaces of said distal portions, when separated to a predetermined degree, lying in a common circle having a diameter slightly exceeding the outer diameter of said piston whereby said piston may be axially entered through the orifice defined by said distal portions.

3,866,300

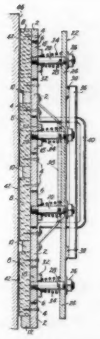
SETTING DEVICE FOR CORK BRICK OR THE LIKE

William A. Bell, 286 Rosemont Gardens, Lexington, Ky. 40503

Filed June 25, 1974, Ser. No. 482,862

Int. Cl. E04f *21/18*

U.S. Cl. 29—270 **9 Claims**



1. A setting device for cork brick or the like comprising a normally generally planar base plate member having a plurality of openings therethrough;

sharp prongs projecting from the front face of said plate adjacent each of said openings;

a pusher member in each of said openings and yieldable means normally holding said pusher members substantially flush with said front face, said members being mounted on said plate for movement outwardly of said front face whereby cork bricks or the like may be impaled on said prongs to overlie said openings and members and the device positioned to place said bricks against a receiving surface and the members pushed outwardly of said openings against the action of said yieldable means to thereby push said bricks off said prongs and into engagement with said receiving surface; and means on said front face of said plate arranged to position said cork brick or the like in a predetermined array thereon in uniformly spaced apart relation.

3,866,301
PROCESS FOR FORMING SHEET MATERIAL WITH EXCELLENT SURFACE CHARACTERISTICS

James A. Salsgiver, Sarver, Pa., assignor to Allegheny Ludlum Industries, Inc,, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,702
Int. Cl. B23p *17/00*
U.S. Cl. 29—412 6 Claims

1. A process for forming sheet material substantially free from surface imperfections from brittle metal that cannot successfully be rolled comprising:

A. casting an ingot of the brittle metal,

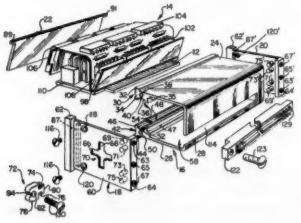
B. maintaining the ingot at a non-damaging temperature at which the metal will creep and under a gas pressure of at least 7,500 psi for a period of time sufficient to substantially eliminate porosity,

C. slicing the resultant non-porous ingot into sheets.

3,866,302
METHOD OF MAKING A PANEL METER CONSTRUCTION

Bernard M. Gordon, Magnolia; Brant W. Becker, Sudbury, and Charles Prescott, Wilmington, all of Mass., assignors to Gordon Engineering Company, Wakefield, Mass.

Division of Ser. No. 269,031, July 5, 1972, Pat. No. 3,780,353. This application Aug. 20, 1973, Ser. No. 390,158
Int. Cl. B23p *17/00*
U.S. Cl. 29—417 6 Claims



1. A method of making a casing for electronic components comprising the steps of:

(a) extruding a frame of indefinite length having a substantially U-shaped profile in cross section and formed with integral top, bottom and rear walls and open sides, forward edges of said top and bottom walls defining a receiving orifice;

(b) severing said frame into a section of definite length;

(c) temporarily enlarging said receiving orifice by moving said top and bottom walls away from each other at the forward edges thereof;

(d) inserting a component package into said frame; and releasing said top and bottm walls and restoring said receiving orifice to its original configuration;

(f) mounting sidewalls to said frame at said open sides thereof.

3,866,303
METHOD OF MAKING CROSS-ROLLED POWDER METAL DISCS

Stephen E. Chehi, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

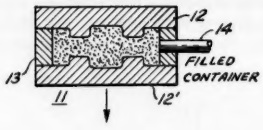
Filed June 27, 1973, Ser. No. 374,149
Int. Cl. B22f *3/24*
U.S. Cl. 29—420.5 4 Claims

1. A method of making contoured metal disc shapes by hot-rolling comprising the sequential steps of:

a. providing a container having an integral contoured interior surface filled with metal powder,

b. sealing, evacuating and heating the container,

c. rolling the container in a rolling mill in a plurality of rolling steps with the direction of each rolling step relative to the workpiece changed from the direction of rolling of the preceding step to reduce and compact the powder filled container, and

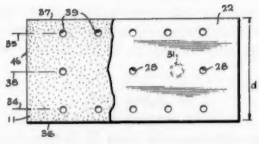


d. removing the container from the metal stock.

3,866,304
METHOD OF PIERCING AIR SUCTION HOLES IN ABRASIVE SHEET MATERIAL

Alma A. Hutchins, 49 N. Lotus Ave., Pasadena, Calif. 91107

Division of Ser. No. 282,155, Aug. 21, 1972, Pat. No. 3,788,011. This application July 16, 1973, Ser. No. 379,209
Int. Cl. B23p *9/00*
U.S. Cl. 29—445 3 Claims



1. The method that comprises:

attaching a sheet of abrasive material to a power actuated movable section of a sander with said sheet adjacent an outer surface of said section through which a plurality of suction openings in a predetermined pattern extend for drawing air and abraded particles from the vicinity of a work piece;

said sheet at the time of initial attachment to said movable section being imperforate at the location of said suction openings;

positioning opposite said sheet of abrasive material a piercing tool having a plurality of piercing projectons arranged in a pattern corresponding to the pattern of said suction openings;

locating said piercing tool so that said projections are directly opposite and project toward said suction openings;

relatively moving said projections and said movable section and carried sheet toward one another and along an axis essentially perpendicular to said sheet while maintaining said projections in axial alignment with said suction openings; and

forcing said projections through said sheet at the locations of said suction openings by said relative movement between the projections and movable section and carried sheet to form apertures in the sheet aligned with and communicating with said suction openings in said movable section.

3,866,305

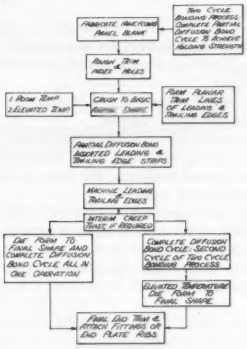
INTERNALLY STIFFENED CONTOURED SHELL STRUCTURE AND METHOD FOR FABRICATING SAME

Charles E. Conn, Jr., Santa Ana, Calif., assignor to Tool Research & Engineering Corporation, Beverly Hills, Calif.

Filed Aug. 14, 1972, Ser. No. 280,645

Int. Cl. B23k *19/00*

U.S. Cl. 29—471.1 **23 Claims**


FABRICATE MULTICORE PANEL BLANK
TWO CYCLE BONDING PROCESS COMPLETE PARTIAL DIFFUSION BOND CYCLE TO ACHIEVE ADEQUATE STRENGTH
ROUGH TRIM INDEX HOLES
1 ROOM TEMP. 2 ELEVATED TEMP.
CRUSH TO BASIC CONTOUR
FINISH TRIM LINES OF LEADING & TRAILING EDGES
RADIAL DIFFUSION BOND ASSORTED LEADING & TRAILING EDGE STRIPS
MACHINE LEADING TRAILING EDGES
INTERIM CREEP SIZE IF REQUIRED
CREEP FORM TO FINAL SHAPE AND COMPLETE DIFFUSION BOND CYCLE ALL IN ONE OPERATION
COMPLETE DIFFUSION BOND CYCLE SECOND CYCLE OF TWO CYCLE BONDING PROCESS
ELEVATED TEMPERATURE CREEP FORM TO FINAL SHAPE
FINAL END TRIM & ATTACH FITTINGS OR END PLATE RIBS

1. A method for fabricating thin skin, internally stiffened, contoured shell structures comprising the steps of:

a. fabricating a panel blank comprised of a metallic cellular core disposed between and joined to first and second planar metallic face sheets, said face sheets each having a thickness dimension substantially less than its surface dimensions, said cellular core being partially diffusion bonded to said face sheets only to acheive sufficient strength to maintain said panel blank in an operative relationship, but less than final design strength;

b. forming said panel blank into a basic shape and imparting thereto basic contours in an initial forming operation;

c. forming edges along the periphery of said panel blank;

d. finally diffusion bonding said cellular core to said face sheets to achieve final design strength; and

e. forming said panel blank into its final shape and imparting thereto its final contours in a final forming operation.

3,866,306

METHOD OF HYDROSTATICALLY EXTRUDING COMPOUND MATERIAL AND COMPOUND BILLETS

Torsten Korsell; Hans Larker; Erik Lundblad, and Jan Nilsson, all of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

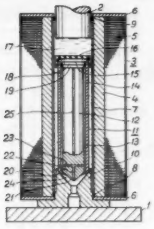
Filed Jan. 29, 1974, Ser. No. 437,652

Claims priority, application Sweden, Jan. 30, 1973, 73012452

Int. Cl. B21d *39/04*

U.S. Cl. 29—474.3 **7 Claims**

1. Method of manufacturing rods, wire or tubes of compound material having a core of one material and a casing surrounding the core of another material, which comprises hydrostatically extruding a billet comprising a core part having a conical point, a casing part surrounding the core part of substantially greater internal diameter than the external diameter of the core part, so that a space exists within the casing on the outside of the core part, said core part being shaped as a truncated cone at one end, said cone securing the casing part axially with respect to the point of the core part, and sealing means at the rear end of the billet for preventing pressure medium from penetrating into a gap formed between the core part and casing part which comprises inserting said billet in a pressure chamber and pressing it by a surrounding pressure medium through an opening in a die giving a product having the desired cross-section, in which one of the parts of the billet (**11**) has an air-escape channel opening adjacent the point



(**21**) of the billet into the die opening which communicates with said space by which the air enclosed between the core part (**12**) and the casing part (**18**) is expelled from the billet (**11**) when the casing part (**13**) is forced into contact with the core part (**12**) during the extrusion process.

3,866,307

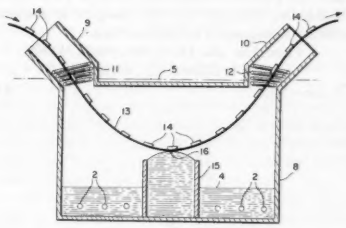
METHOD FOR SOLDERING, FUSING OR BRAZING

Robert Christian Pfahl, Jr., Chester, and Hans Hugo Ammann, Morris, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 7, 1973, Ser. No. 395,310

Int. Cl. B23k *31/02, 1/08, 1/00*

U.S. Cl. 29—498 **17 Claims**



1. Method for performing on an article at elevated temperature an operation comprising the melting of material, said method comprising:

a. continuously boiling substantially at atmospheric pressure a heat transfer liquid having a boiling point equal to the said elevated temperature and at least equal to the melting point of said material, thereby generating a body of saturated vapor of said heat transfer liquid at said elevated temperature;

b. inserting said article into said body of saturated vapor;

c. condensing saturated vapor directly on and in contact with said article thereby to heat said article to said elevated temperature by transfer of latent heat of vaporization from said condensed vapor to said article;

d. performing said operation on said article.

3,866,308
METHOD OF MAKING A COLUMN FOR CHROMATOGRAPHY

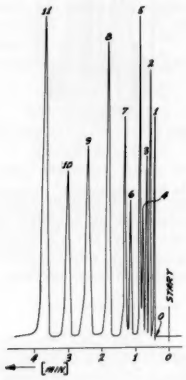
Istvan Halasz, Kobenhuttenweg 56, Saarbrucken; Jurgen Asshauer, Dudweiler; Richard Endele, Saarbrucken, and Klaus De Haas, Ludwigshafen, all of Germany, assignors to said Halasz, by said Asshauer, Endele and De Haas

Filed Mar. 4, 1974, Ser. No. 447,930

Claims priority, application Germany, Mar. 30, 1973, 2315904

Int. Cl. B23p *17/00*

U.S. Cl. 29—527.4 5 Claims



1. In a method of making a chromatographic separation column which includes using a drawn metal tube and packing it with granular or powdered material for chromatographic operation, the improvement comprising the step of removing a surface layer from the inner wall of the tube prior to packing.

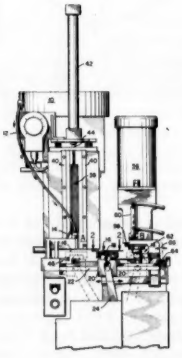
3,866,309
APPARATUS FOR MACHINING CHUCK JAW ELEMENTS

John H. Rohlfs, Torrington, Conn., assignor to Jamieson Manufacturing Company, Torrington, Conn.

Filed Jan. 28, 1974, Ser. No. 436,960

Int. Cl. B23q *7/00*; B23p *23/00*

U.S. Cl. 29—563 11 Claims



1. Apparatus for machining at least one angular flat and a thread segment on a small cylindrical work piece whereby to provide a chuck jaw element; said apparatus comprising,

a hopper for holding a plurality of cylindrical work pieces,

a transfer device associated with said hopper and adapted sequentially to deliver said cylindrical work pieces to a first work station removed from said hopper,

an escapement mechanism at said first work station,

a first work holder movable between first and second positions the former of which is at said first work station,

said work holder and escapement mechanism cooperating at said first work station sequentially to transfer cylindrical work pieces from said transfer device to said movable work holder,

a broaching tool movable in one and an opposite direction at said first work station for sequentially machining said flats on cylindrical work pieces held at said station by said work holder,

a milling cutter disposed at a second work station removed from said first work station,

a second work holder at said second work station,

means for moving said first work holder between its said first and second positions, the latter positioned being at said second work station,

and means for transferring said cylindrical work pieces sequentially from said first work holder to said second work holder at said second work station for milling threads in said work piece whereby to complete said chuck jaw element.

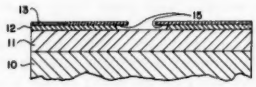
3,866,310
METHOD FOR MAKING THE SELF-ALIGNED GATE CONTACT OF A SEMICONDUCTOR DEVICE

Michael C. Driver, Trafford, and Martin J. Geisler, Murrysville, both of Pa., assignors to Westinghous Electric Corporation, Pittsburgh, Pa.

Filed Sept. 7, 1973, Ser. No. 395,319

Int. Cl. B01j *17/00*

U.S. Cl. 29—571 2 Claims



1. A method of making a self-aligned gate field-effect transistor comprising the steps of:

A. applying a metal layer suitable for forming source and drain contacts for a field-effect transistor on a major surface of a semiconductor member having a low resistivity region adjoining the major surface and a high resistivity region adjoining the low resistivity region and extending into the semiconductor member to form a channel of a field-effect transistor;

B. overlaying the metal layer with a resist layer;

C. forming in the resist layer at least one window pattern corresponding to a desired self-aligned gate contact;

D. undercutting and removing portions of the metal layer adjacent the window pattern to expose portions of the major surface of the semiconductor member and cause undercut portions of the metal layer adjacent the window pattern to overhang and shield exposed portions of said major surface;

E. simultaneously with step D, forming source and drain contacts for a field-effect transistor in the metal layer; and

F. thereafter depositing metal capable of forming a Schottky barrier contact with the semiconductor member through the window pattern on unshielded exposed portions of the major surface of the semiconductor member to form a self-aligned Schottky barrier gate contact for a field-effect transistor.

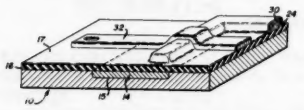
3,866,311
METHOD OF PROVIDING ELECTRICALLY ISOLATED OVERLAPPING METALLIC CONDUCTORS

Henri J. Salles, Palo Alto, and David R. Newby, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 152,531, June 14, 1971, abandoned. This application June 18, 1973, Ser. No. 370,925

Int. Cl. B01j *17/00*

U.S. Cl. 29—578 **9 Claims**



1. A method of making a semiconductive device having overlying metallic interconnects, comprising the steps of:

developing a semiconductive body including at least two semiconductive portions of opposite conductivity type terminating at a surface of said body and forming a pn junction therebetween;

growing a thermal oxide layer on said surface;

providing a first opening through said oxide layer above said first portion and a second opening through said oxide layer above said second portion;

forming a first metallic conductor on said thermal oxide layer and in intimate contact therewith and extending through said first opening to ohmically contact said first portion;

exposing said oxide layer with said first conductor to an aqueous solution to form an hydrated oxide only on the exposed surfaces of said conductor; and

forming a second conductor on said thermal oxide layer which has at least a portion overlying said first conductor and said hydrated oxide and which extends through said second opening to ohmically contact said second portion, said first and second conductors being electrically isolated from each other by said hydrated oxide.

3,866,312
METHOD OF CONTACTING SEMICONDUCTOR REGIONS IN A SEMICONDUCTOR BODY

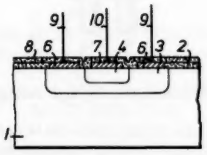
Werner Mroczek, Heilbronn, and Werner Scherber, Nordheim, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Nov. 30, 1971, Ser. No. 203,389

Claims priority, application Germany, Dec. 1, 1970, 2058931

Int. Cl. H01l *7/64*

U.S. Cl. 29—578 **18 Claims**



18. A method of making a transistor comprising the steps of: diffusing internested base and emitter regions into a semiconductor body having the conductivity of a collector region, so as to lie at one surface of said semiconductor body, removing a first insulating layer formed during the diffusion process from said one surface of said semiconductor body at least from said base and emitter regions up to adjacent the outermost edge of said base region, applying a coherent metal layer directly to at least the exposed portion of said one surface of said semiconductor body to cover same, making base and emitter electrodes from said coherent metal layer, applying a second insulating layer to said one surface of said semiconductor body, and making electrically conducting connections with said base and emitter electrodes through said second insulating layer by means of electrical leads.

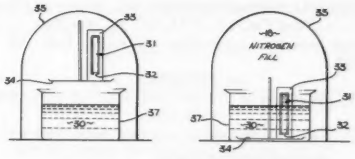
3,866,313
METHOD OF MANUFACTURING LIQUID CRYSTAL DISPLAY

James Yih, Sunnyvale, Calif., assignor to Microma Incorporated, Cupertino, Calif.

Filed Apr. 11, 1973, Ser. No. 350,070

Int. Cl. H01j *5/02*; **G02f** *1/28*

U.S. Cl. 29—592 **4 Claims**



2. A process for filling and sealing a liquid crystal display device containing a liquid crystal material and a pair of substrates, the steps comprising:

forming a cavity between said substrates said cavity suitable for containing said liquid crystal material;

degassing said liquid crystal material and the surfaces of said substrates by placing said liquid crystal display device in a partial vacuum with said liquid crystal material; placing said liquid crystal display device into said liquid crystal material while in a partial vacuum;

filling said cavity of said liquid crystal display device by replacing the partial vacuum with a non-reacting gas whereby said liquid crystal material is forced into said cavity between said substrates; and

sealing said cavity of said liquid crystal display device.

3,866,314
DYNAMOELECTRIC MACHINE ROTOR ASSEMBLY DEVICE AND METHOD

William M. Stone, and John M. Braunschwig, both of DeKalb, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Aug. 14, 1973, Ser. No. 388,302

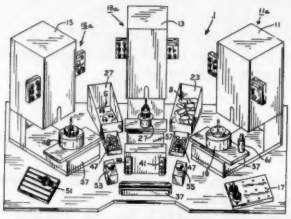
Int. Cl. H02k *15/04*

U.S. Cl. 29—598 **45 Claims**

1. A method of operating a single operator, multiple work station for assembling components onto a rotatable assembly for a dynamoelectric machine comprising the steps of:

a. positioning a generally flat fan stamping onto an end portion of the rotatable assembly at one of the work

stations and securing the stamping to at least a part of the end portion; and



b. moving the rotatable assembly to another of the work stations and forming fan vanes from the stamping while it is secured to the rotatable assembly.

3,866,315

METHOD OF MAKING A STABILIZED SUPER-CONDUCTOR

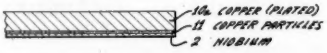
Gerhard Ziemek, Hannover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte AG, Hannover, Germany

Filed Feb. 21, 1974, Ser. No. 444,568

Claims priority, application Germany, Feb. 22, 1973, 2308747

Int. Cl. H01v *11/14*

U.S. Cl. 29—599 **7 Claims**



1. In a method of making a stabilized superconductor assembly which includes electrolytically depositing copper on a surface of a substrate containing niobium, the improvement comprising: brushing finely divided copper particles into the substrate surface, causing the copper particles to become worked into the niobium substrate to obtain a very thin copper particle layer in the substrate surface, and subsequently electrolytically depositing copper upon the copper particle-covered surface.

3,866,316

METHOD FOR MANUFACTURING AN INSULATED COIL

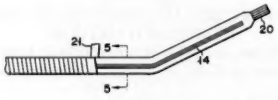
Taichi Takechi; Ryozi Kumazawa; Kimikazu Umemoto; Toshimitsu Yamada; Junichi Kamiuchi, all of Yokohama, and Eiji Koyanagi, Fujisawa, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Saiwai-ku and Tokyo Shibaura Electric Co., Ltd., Kawasaki shi, both of, Japan

Filed Dec. 13, 1973, Ser. No. 424,273

Claims priority, application Japan, Dec. 25, 1972, 47-129310

Int. Cl. H01f *7/06*

U.S. Cl. 29—605 **8 Claims**



1. A method for manufacturing an insulated coil, comprising the steps of winding an insulating tape layer by layer around a conductor with and inserting at least one string-like substance having an outer peripheral synthetic resin layer between the layers of the insulating tape so that a gap is created around the substance between the adjacent layers, impregnating a molten synthetic resin between the layers of the insulating tape and into said gap, and heating the resultant coil to cause the impregnated synthetic resin to be fused together with the outer peripheral synthetic resin layer of the string-like substance to provide an insulated coil.

3,866,317

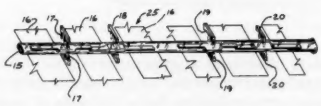
REED SWITCHES AND PROCESS FOR MAKING THEM

Vaughan Morrill, Jr., St. Louis, Mo., assignor to Morex, Inc., St. Louis, Mo.

Division of Ser. No. 290,113, Sept. 18, 1972, Pat. No. 3,794,944. This application Sept. 26, 1973, Ser. No. 400,796

Int. Cl. H01h *11/00*

U.S. Cl. 29—622 **7 Claims**



1. A method of forming a reed switch comprising forming a non-circular, non-magnetic tube, inserting into said tube and positioning in lengthwise spaced positions a plurality of sets of pairs of reed switch elements, each of said elements including a reed section, a sealing section engaging the inner wall of said tube, and a lead section, the reed elements of each set being in facing and partly overlapping position, and thereafter sealing the reed elements of each set within said tube along at least a part of said sealing section.

3,866,318

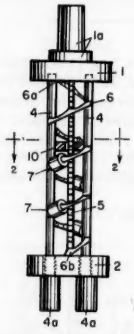
METHOD OF MANUFACTURING HIGH-VOLTAGE FUSE

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Division of Ser. No. 396,579, Sept. 12, 1973, Pat. No. 3,843,948. This application May 8, 1974, Ser. No. 467,939

Int. Cl. H01h *69/02*

U.S. Cl. 29—623 **2 Claims**



1. A method of manufacturing high-voltage fuses including the steps of

a. arranging a pair of plug terminals in coaxial relation and spacing said pair of plug terminals by insulating strip means and by a plurality of metal rods arranged parallel to the axis of said pair of plug terminals and extending through bores in one of said pair of plug terminals to the axially outer surface thereof;

b. winding fusible element means helically around said insulating strip means and said plurality of metal rods so as to be located in the surface of a prism whose edges are defined by said insulating strip means and said plurality of

metal rods, and thereafter conductively connecting the ends of said fusible element means to said pair of plug terminals;

c. inserting the structure formed by said pair of plug terminals, said insulating strip means, said plurality of metal rods and said fusible element means into a tubular casing of insulating material and affixing said casing to said pair of plug terminals; and thereafter

d. filling said casing with a pulverulent arc-quenching filler through an aperture in one of said pair of plug terminals and gradually drawing said plurality of metal rods out of said casing while leaving said insulating strip means inside of said casing.

3,866,319

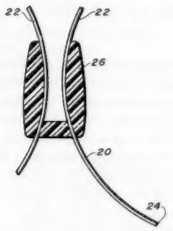
PRINTED CIRCUIT EDGE CONNECTOR

Carl J. Steigerwald, Wauconda, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Division of Ser. No. 228,099, Feb. 22, 1972, Pat. No. 3,795,049. This application Sept. 12, 1973, Ser. No. 396,556

Int. Cl. H02g *15/00*

U.S. Cl. 29—629 **3 Claims**



1. An improved method for manufacture of edge connector assemblies having electrical contact elements embedded therein, said method comprising steps of:

forming a continuous strip of electrical contact elements in which the contact elements are oriented in parallel spaced apart relationship and are joined at, at least one end, by a carrying strip;

passing the continuous strip of electrical contact elements through an extruding means in which an insulating body of plastic material is continuously extruded in combination with the strip of contact elements;

forming an extruded assembly in which the contact elements are partially embedded within the insulating body and are partially exposed at opposite ends, and in which the carrying strips are exposed;

removing the carrying strips; and

separating the extruded assembly into predetermined lengths for use as edge connectors.

3,866,320

GUIDE BAR ADJUSTMENT FOR CHAIN SAW

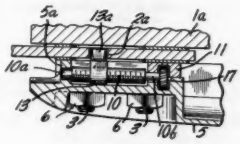
Rudolph Progl, Bayside, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Mar. 4, 1974, Ser. No. 448,053

Int. Cl. B27b *17/14*

U.S. Cl. 30—386 **9 Claims**

1. In a chain saw having a chassis, an elongated guide bar mounted on and extending forwardly from the chassis, a saw chain running on the guide bar and a cover enclosing a rear end portion of the guide bar; means for adjustable moving the guide bar in a lengthwise direction relative to the chassis to adjust the tightness of the chain on the guide bar, comprising an elongated adjusting screw, means rotatably mounting said adjusting screw in fixed location relative to the chassis adjacent a rear end portion of the guide bar and with its longitudinal axis extending lengthwise of the guide bar, an internally threaded rider on said screw in engagement with threads thereof and movable lengthwise of the screw by rotation of the screw, means interconnecting said rider and guide bar to move the guide bar in a lengthwise direction by said rider, a first gear fixed on and rotatable with said screw, a second gear meshing with said first gear and rotatable about an axis normal



to the axis of said screw, and driving means fixed with said second gear and extending to the outside of said cover, said driving means having means accessible from outside said cover for rotating said driving means and thereby rotating said second gear, first gear and screw to move said rider and guide bar in a direction lengthwise of the guide bar to adjust the tightness of said chain.

3,866,321

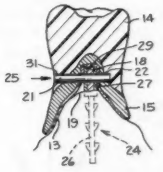
CROWN AND BRIDGE PREFABRICATED SYSTEM AND IMPLANT

Maurice Valen, 40-17 82nd St., Jackson Heights, N.Y. 11373

Filed Jan. 2, 1974, Ser. No. 430,171

Int. Cl. A61c *13/00*

U.S. Cl. 32—10 A **10 Claims**



1. A tooth implant for anchoring at least one artificial tooth to a jaw bone in a mouth of an individual, comprising:

a blade-like section having a thin cross-section and having a plurality of flexible cup-like protuberances protruding therfrom, said cup-like protuberances acting to anchor said blade-like section to the walls of said jaw bone, but being flexible so as to give when they abut against the bone of the jaw in order to prevent necrosis; and

at least one stem section extending from said blade-like section into the mouth of the individual, said stem section adapted to receive an artificial tooth disposed thereon.

3,866,322

ORTHODONTIC DEVICE

Clifford James Broussard, and Garfford Broussard, both of 9183 Katz, Houston, Tex. 77024

Filed May 14, 1973, Ser. No. 360,054

Int. Cl. A61c *7/00*

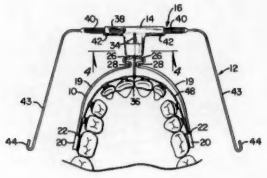
U.S. Cl. 32—14 D **10 Claims**

1. An orthodontic device for use with a head gear for applying both tractional and torsional forces to selected teeth, said device comprising:

an inner bow lying substantially in a first plane and having spaced ends connectable to buccal attachments on posterior teeth;

an outer bow lying substantially in a second plane and having spaced ends connectable to the head gear;

means pivotally connecting said inner bow to said outer bow at the center of each so that said inner bow is pivotal with respect to said outer bow about an axis lying in at least one of said first and second planes; and



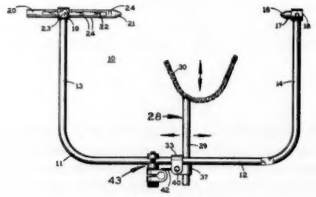
resilient force-applying means connected between said inner and outer bows applying a torsional force about said axis to said inner bow and to the posterior teeth when the ends of the inner bow are connected to the buccal attachments and the ends of the outer bow are connected to the head gear.

3,866,323

DENTAL FACE BOW AND METHOD OF USING SAME

Ernest R. Granger, Pelham, N.Y., assignor to Richard R. Granger and Robert K. Granger, both of Pelham Manor, N.Y.

Filed July 30, 1973, Ser. No. 384,077
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 D **5 Claims**



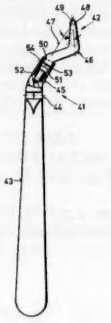
1. In combination with a dental articulator having intercondylar markings separated by uniform first increments and numbers indicative of said markings, a dental facebow comprising a U-shaped frame including a cross-piece and a pair of rearwardly directed side arms, a stationary first transversely inwardly directed stylus mounted proximate the free end of one of said side arms, an axially movable second transversely inwardly directed stylus mounted proximate the free end of the other side arm and having longitudinally spaced markings separated by uniform second increments of twice the length of said first increments and carrying numbers indicative of said markings thereon and which correspond to the intercondylar numbers on said articulator, the styli being axially aligned, a bite form including a rearwardly disposed bite section and a forwardly directed shank, and a universally adjustable coupling slidably adjustable along said cross-piece and axially adjustably engaging said form shank.

3,866,324

DENTAL FORCEPS

Julius Walser, Teggingerstrasse 14a, 776 Radolfzell, Germany

Filed Nov. 19, 1973, Ser. No. 416,859
Claims priority, application Germany, Nov. 22, 1972, 2257156
Int. Cl. A61c *3/14*
U.S. Cl. 32—66 **14 Claims**



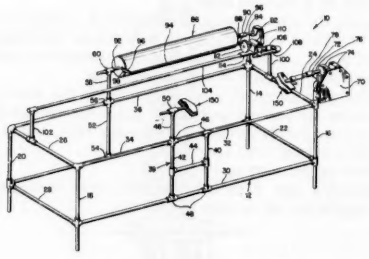
1. A forceps comprising a pair of pivotally connected handles, an integral arm on each handle swingable about the pivot to move toward each other as the handles are squeezed toward each other, a jaw member rotatably mounted in each arm and extending therefrom, a gripping nose on the end of each jaw terminating in a tip end and said jaws rotating to follow the contour of a member gripped by said tip ends to distribute the gripping load along the length of said noses and thereby reduce the unit loading.

3,866,325

CLOTH MEASURING DEVICE

Lawrence V. Wynn, 1900 N.W. 95th, Seattle, Wash. 98107

Filed Nov. 9, 1972, Ser. No. 305,158
Int. Cl. G01b *5/04*
U.S. Cl. 33—129 **18 Claims**



1. Cloth measuring device comprising:

a. a support frame,

b. a first pair of coaxially aligned, spaced apart mounting means supported on said frame for receiving a holder including first drive means for bi-directionally and singularly rotating one of said first pair of mounting means independently from the other of said first pair, said other of said first pair of mounting means being coaxially movable on said frame with respect to said one mounting means,

c. a second pair of coaxially aligned, spaced apart mounting means supported on said frame for receiving a member on which cloth is wound from the holder on said first pair

of mounting means including, second drive means for bi-directionally and singularly rotating one of said second pair of mounting means independently from the other of said second pair, said second pair of mounting means and member being generally parallel to and spaced from said first pair of mounting means and holder,

d. cloth measuring means disposed between said pair of mounting means and said member, and

e. control means for adjusting the speed at which said first and second drive means respectively rotate said one of said first and second pairs of mounting means so that when cloth is being unwound from a holder supported by said pair of mounting means to said member there is essentially no tension to distort the cloth and cause the cloth measuring means to be inaccurate, and when said cloth is rewound from said member back to said holder a predetermined tension is applied to the cloth to obtain a tight, compact rewind of the cloth on said holder.

3,866,326

DRAWING BOARD

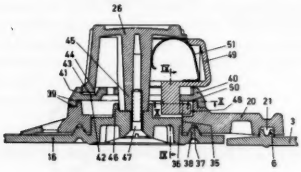
Walter Hebel, and Ulrich Hebel, both of 4 Bruckenstrasse, 5242 Kirchen (Seig), Germany

Filed Aug. 14, 1972, Ser. No. 280,270

Claims priority, application Germany, Aug. 16, 1971, 2140903; Feb. 7, 1972, 2205621

Int. Cl. B43l *13/02, 13/24*

U.S. Cl. 33—76 R **4 Claims**



1. A drafting instrument, comprising

a. a drawing device,

b. a sliding piece, and

c. a connecting means between the sliding piece and the drawing device, the connecting means being adaptable to alternative selective placement in a first state wherein the sliding piece and the drawing device are movable with respect to one another, and a second state wherein the sliding piece and the drawing device are held rigid with respect to one another, the connecting means including a hole (**24**), a peripheral flange about the hole, a threaded, turntable ring (**30**) rotatably and concentrically mounted on the flange, holding means for preventing axial movement of the ring with respect to the hole, a threaded, service knob (**26**) engageable by the threads of the ring to draw the knob through the hole, and an abutment connected to one end of the knob to prevent the knob from passing through the hole and when the abutment is drawn adjacent the hole, to prevent rotation of the knob with respect to the hole.

3,866,327

ADJUSTABLE SPOOL AND SPOOL SYSTEM

Elmo J. Pacini, Sudbury, Mass.; Alford H. Johnson, Pittsford, N.Y., and Robert B. Turner, Jr., Needham, Mass., assignors to Deaderich and Royster Inc., Charlotte, N.C.

Division of Ser. No. 82,403, Oct. 20, 1970, Pat. No. 3,739,649. This application June 6, 1973, Ser. No. 367,629

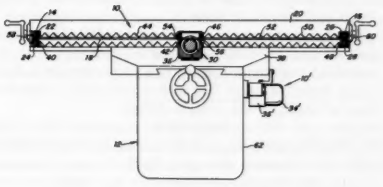
Int. Cl. G01b *5/02*

U.S. Cl. 33—125 R **4 Claims**

1. A spool system for precisely calibrating the rotary motion of a spool about its axis with relation to relative motion of the spool along a wire looped at least one time about the spool and having two ends, one anchored on either side of the spool comprising

a first annular member having external peripheral guide means and having an axially tapered internal bore of hollow conical cross-section;

a second plug member having an external axially tapered circumferential surface of substantially the same taper as said internal bore for fitting into and cooperating with said axially tapered internal bore;



means for adjusting the depth of penetration of said plug member into said annular member to control the spreading of said annular member by said plug member to precisely control the outer diameter of the annular member; first support means for anchoring said wire at one end and second support means for anchoring said wire at the other end, at least one of said support means including means for displacing one of the anchored ends of said wire relative to the other in the direction parallel to the axis of said spool for accommodating for lateral displacement of the wire caused by its loop about said spool.

3,866,328

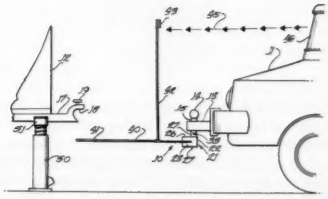
TRAILER HITCH GUIDE

Earl L. Alexander, and Robert K. Taylor, both of 3427 W. 11th St., Wichita, Kans. 67203

Filed Jan. 11, 1974, Ser. No. 432,636

Int. Cl. G01c *5/00*

U.S. Cl. 33—264 **4 Claims**



1. A trailer hitch guide device for visually assisting a driver in maneuvering a vehicle having a first engageable portion of a trailer hitch secured on the rear part thereof, such as a ball socket portion, to a position relative to a trailer having a second engaging portion of said trailer hitch on the forward part thereof, such as a socket portion, so as to align said ball portion with said socket portion such that they may be removably engaged together to hitch the trailer to the vehicle, the guide device comprising:

a member adapted to be detachably attached to said ball portion and disposed beneath the same in a position not to interfere with said socket portion;

means detachably attaching said member to said ball portion of the trailer hitch;

a pair of coplanar horizontally extending spaced apart flexible rod members each having a longitudinal portion, one end of each longitudinal portion being attached to said member on either side of said ball portion, an end portion

diverging outwardly from the other end of said longitudinal portion, said diverging portion of each rod member cooperating with the diverging portion of the other rod member to form a funnel-type portion which leads into a longitudinal portion which is in alignment with said ball portion;

a pair of flagstaffs, each flagstaff having one end affixed to one of said rods with the flagstaff projecting a substantial distance vertically upright therefrom and terminating at a top end which is disposed in the line of vision of the vehicle driver peering through the rear view mirror or through a back window of the vehicle while viewing the front surface of the trailer;

a pair of flag members, each flag member associated with one of said flagstaffs and permanently affixed to the top terminal end thereof, each flag projecting in a direction away from the other flag and substantially normal to the line of vision of the vehicle driver;

whereby said rods are adapted to cooperate with a jack or the like disposed beneath the socket portion of the trailer hitch for elevating the same, such that movement of one of the flag members indicates to the vehicle driver that the jack is contacting one side of the funnel-type arrangement and the ball portion is not in alignment with the socket portion and also indicates the direction in which the ball portion must be maneuvered to place the same into alignment with the socket portion.

3,866,329

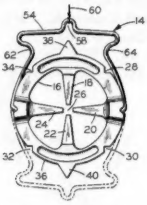
COMBINATION VERTICAL AND HORIZONTAL PLUMB BOB

Robert F. West, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Mar. 27, 1974, Ser. No. 455,195

Int. Cl. G01c *15/10*

U.S. Cl. 33—392 **10 Claims**



1. A plumb bob for use in a horizontal or vertical plane comprising: a body member having an aperture extending therethrough at the center thereof, indexing means including a projection provided on the periphery of said body member in alignment with a line drawn through the center thereof, and suspension means engaged with said body member permitting suspension of said body member in said horizontal plane with the principal plane of said body member disposed perpendicularly with respect to the principal plane of said suspension means with said aperture in the center of said body and in said vertical plane with the principal plane of said body member and the principal plane of said suspension means lying in the same plane with said projection at the lower end of said body.

3,866,330

LAUNDRY APPARATUS AND METHOD OF LAUNDERING

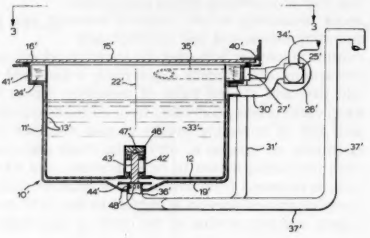
Charles Ernest Hooper, 1353 Blackwell Rd., Sarnia, Ontario, Canada (N7T 7H4)

Filed Nov. 26, 1973, Ser. No. 418,992

Int. Cl. F26b *5/08*

U.S. Cl. 34—8 **16 Claims**

11. Method of laundering comprising supplying gas from a source thereof external of an enclosable, pressurizable container against members presented by at least a portion of the container to rotate said portion of the container, and directing said gas from said members presented by said portion of the



container into the pressurizable container to increase static pressure therewithin for expulsion of a body of liquid from the container through a drain provided therein.

3,866,331

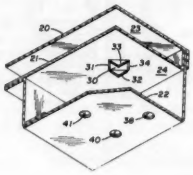
FLOW CONTROL SHRINK WRAP TUNNEL

Stephen M. Evans, Jr., Dallas, Tex., assignor to ITP Corporation, Dallas, Tex.

Filed Mar. 7, 1974, Ser. No. 449,053

Int. Cl. F26b *19/00*

U.S. Cl. 34—216 **10 Claims**



1. In a heat shrink tunnel through which the articles pass and in which a supply chamber is flow connected to the interior of said tunnel by way of a perforated baffle plate leading to a discharge chamber and an output perforated plate leading from the discharge chamber, said baffle and output plates being positioned in a spaced parallel relationship, the combination which comprises:

a. structure adjacent to each hole in said baffle plate to compound turbulence in air passing from the supply chamber to the discharge chamber for equalizing the volume and velocity of air flow through the perforations in the plate leading from the discharge chamber, and

b. perforations in said output plate whose axes are spaced from the axes of holes in said baffle plate.

3,866,332

FLUIDIZED BED DRYER

Gerald Hertz, Pennside, Pa., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed June 6, 1972, Ser. No. 260,156

Int. Cl. F26b *17/10, 3/08*

U.S. Cl. 34—57 A **1 Claim**

1. Apparatus for drying particulate material comprising:

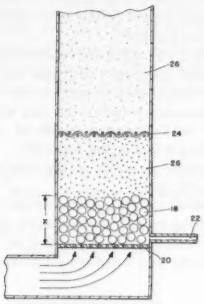
a. a chamber;

b. a gas permeable support at the lower portion of said chamber;

c. a bed of inert thermally stable particles on said gas permeable support;

d. means to introduce said particulate material to be dried into said bed;

e. a screen located above said bed in a position to intercept and retain said bed of inert particles, said screen having a mesh small enough to prevent said inert particles from passing therethrough but large enough to allow dried particulate material to pass therethrough, and said screen being located from said bed a distance at least equal to



the depth of said bed but not greater than six times its depth, whereby particulate material adhering to said inert particles or to said screen is dislodged therefrom upon the impingement of said inert particles with said screen.

f. means to introduce a heated gas into said bed from beneath said support at a velocity sufficient to fluidize said inert particles and to blow dried pieces of said material through said screen; and

g. means to collect said dried pieces.

3,866,333

DEHUMIDIFIER FOR AIR UTILIZED IN LAUNDRY DRYING

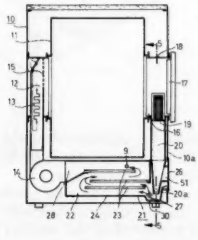
Georg Sarukahanian, and Manfred Kruger, both of Berlin, Germany, assignors to Siemens Electrogerate GmbH, Munich, Germany

Filed Aug. 31, 1972, Ser. No. 285,135

Claims priority, application Germany, Sept. 17, 1971, 2147303; Sept. 23, 1971, 2148127; Sept. 29, 1971, 2149289; Nov. 2, 1971, 2155709; Mar. 23, 1972, 2214619; Mar. 23, 1972, 2214618; Mar. 23, 1972, 2214621

Int. Cl. F26b *21/06*

U.S. Cl. 34—75 **15 Claims**



1. A dehumidifier for removing water from heated, moisture laden air produced during the drying of laundry, the dehumidifier being mounted in a laundry machine of the type having a generally rectangular cabinet provided with a generally vertical forward wall, the dehumidifier comprising,

a generally rectangular housing mounted within the cabinet,

a plurality of generally horizontal, water filled, shallow trays mounted within said housing in overlapped, vertically spaced relation, said trays extending in a generally longitudinal direction with the flow of water along each said tray being from one longitudinal end to the other, each said tray further including adjacent its downstream end an overflow pipe positioned transversely at approximately the center of said tray, said overflow pipe extending upwardly in such relation to the vertical dimensions of said tray that overflow of water occurs only when said tray is nearly filled with water, each being configured so as to have longitudinally extending, downwardly curved portions positioned on either transverse side of said overflow pipe with a drain opening positioned at the lowest point of curvature, said trays being arranged to cause a downward zigzag flow of water from one said tray to the next, and

means for guiding the air across said trays to cause the air to be cooled and dehumidified thereby.

3,866,334

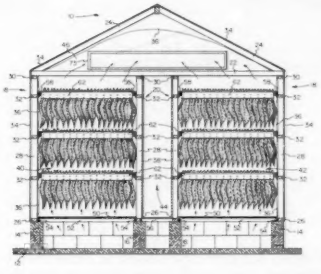
GREENHOUSE-BULK CURING AND DRYING SYSTEM

Barney K. Huang, 5108 Kaplan Dr., Raleigh, N.C. 27606

Filed Sept. 26, 1973, Ser. No. 400,893

Int. Cl. F26b *19/00*

U.S. Cl. 34—93 **4 Claims**



1. A bulk curing and drying structure adapted to utilize the solar energy associated with available solar radiation transmitted into the structure to cure and dry bulk tobacco disposed within said structure, said structure comprising:

a. means for continuously forcing a vertical system of air through at least one curing and drying area of said structure and including means for adding heat to the forced air as necessary to maintain a predetermined temperature within said curing and drying structure;

b. means for receiving and holding tobacco leaves in bulk form within said structure and including support structure means for supporting a volume of tobacco leaves in close side-by-side relationship with the plane of the leaves being generally vertically oriented so as to allow air to pass vertically therethrough, said support structure means disposed transversely across the entire width of the vertical system of forced air for supporting the volume of tobacco leaves transversely across the entire width of the same vertical system of air passing through the curing and drying area of said structure thereby requiring the entire vertical system of air to pass through the supported volume of tobacco leaves without by-passing the same;

c. support means associated with said structure for supporting said tobacco receiving and holding means within said structure;

d. transparent exterior means disposed about a substantial area of said structure for transmitting available solar radiation and the energy associated therewith through said structure and into the internal areas thereof; and

e. heat absorber means generally stationarily disposed interiorly of said transparent exterior means for absorbing the solar energy transmitted through said transparent exterior means and transferring the captured solar energy directly inwardly to the vertical system of air passing through said bulk tobacco disposed within said curing and drying structure and supported by said support structure means, said heat absorber means assuming a position between said transparent exterior means and the bulk volume of tobacco disposed within said structure such that said heat absorber means tends to confine the forced system of air passing through the bulk tobacco interiorly of said heat absorber means thereby permitting the captured solar energy in the form of heat to be transferred directly inwardly to the vertical system of forced air passing on the inner side of said heat absorber means opposite the space between said heat absorber means and said transparent exterior means.

3,866,335

GAS HEATED ROTARY DRIER

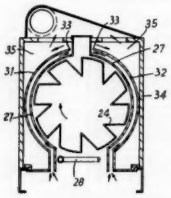
Richard E. G. Neville, Salisbury, England, assignor to AMF Incorporated, White Plains, N.J.

Filed July 16, 1973, Ser. No. 379,743

Claims priority, application Great Britain, July 21, 1972, 34291/72

Int. Cl. F26b *11/02*

U.S. Cl. 34—133 **8 Claims**



1. A rotary drier for particulate or loose material comprising a cylinder arranged to rotate about its axis inclined to the horizontal, said cylinder having formed along its cylindrical surface a plurality of hollow paddles extending axially along said cylinder and inwardly thereof, said paddles being V-shaped in cross section with one side of each paddle being disposed radially and the other side being disposed obliquely thereto, the interior of said paddles communicating with the exterior of the cylinder and at least one gas burner arranged below the cylinder to direct flame into the interior of the hollow paddles.

3,866,336

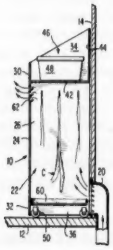
DECORATIVE LAUNDRY DRYER

Helen D. Bereza, Route 3, Box 33, Wausaukee, Wis. 54177

Filed Apr. 12, 1974, Ser. No. 460,495

Int. Cl. F26b *19/00*

U.S. Cl. 34—201 **4 Claims**



1. Portable cabinet for use in association with a heating duct outlet in a building, warm air being emitted through said heating duct outlet, the cabinet comprising:

a cabinet forward wall, and cabinet side walls, each of said walls having opposite upper and lower end portions;

a top wall fixedly secured to the forward and side walls at a location spaced downwardly from the upper end portions thereof, and a back wall projecting upwardly from said top wall, the back wall and those portions of the side and forward wall above the top wall defining a well adapted to receive a decorative device;

surface support means on the side walls adjacent the lower end portions thereof;

brackets on the side walls above the surface support means;

an elongated combined drip pan and laundry transport receptacle removably seated on the brackets and spanning the distance between the side walls;

the forward wall having a series of air passage louvers formed therein below the top wall;

mounting means on each of the side walls in transverse co-alignment; and

a series of laundry drying strand means suspended between said mounting means, the warm air from said duct being directed about laundry suspended on said laundry drying strand means and outwardly through said air passage louvers.

3,866,337

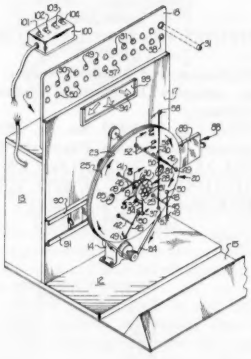
APPARATUS FOR DEMONSTRATING ATOMIC STRUCTURE

Thomas D. Burns, 3413 Lakeside Drive, Matthews, N.C. 28105

Filed July 26, 1973, Ser. No. 382,964

Int. Cl. G09b *23/20*

U.S. Cl. 35—18 A **13 Claims**



1. An apparatus for demonstrating the theoretical structure of an atom to students and other observers and comprising

a frame defining a central axis,

a disc mounted on said frame for rotation about said central axis, said disc including a forwardly facing front surface, means for representing the nucleus of an atom mounted on said frame along said central axis and forwardly of said front surface,

a shaft rotatably carried by said disc, said shaft defining a shaft axis extending parallel to and radially spaced from said central axis and including a forward end positioned forwardly of said front surface,

a transverse member mounted at said forward end of said shaft and extending perpendicular to said shaft axis, said transverse member including two end portions with said

two end portions being positioned on opposite sides of said shaft and substantially equidistant therefrom,

means for representing an electron carried at each of said two end portions,

means for rotating said disc in a first direction about said central axis and at a predetermined rotational speed, and means for rotating said shaft about said shaft axis while said disc is rotated and in a direction opposite said first direction and at a rotational speed substantially corresponding to said predetermined rotational speed such that said electron representing means traces a pair of intersecting elliptical orbits about said nucleus representing means to thereby provide a three dimensional representation of a pair of electrons orbiting the nucleus of an atom.

3,866,338
DYNAMICALLY INTERACTING TOY BLOCKS

Nils Lou, St. Paul, Minn., assignor to Lotus Games, Inc., St. Paul, Minn.

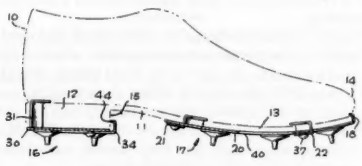
Filed July 25, 1973, Ser. No. 382,499
Int. Cl. A63h *33/04*
U.S. Cl. 35—69 **2 Claims**

1. A dynamically active rectilinear toy block having first, second, and third pairs of faces, said faces being planar and substantially smooth over a substantial portion of their surfaces and the planar portions of each pair of faces comprising rectangular parallel surfaces, the first, second, and third orthogonal dimensions of the block having predetermined ratios with the first dimensions being about three times the second dimension and the third dimension being about twice the first dimension and in which both of the faces defined by said first and third dimensions include a plurality of holes of similar diameters therein which vary in depth and are deeper at one end of the block to make that end of the block lighter.

3,866,339
SHOE ATTACHMENT FOR GOLFERS

Nedwyn M. Latto, 16134 Hartsook St., Los Angeles, Calif. 91316

Filed Feb. 25, 1974, Ser. No. 445,541
Int. Cl. A43b *3/10*
U.S. Cl. 36—7.6 **5 Claims**



1. An attachment device for converting

street shoes for use in playing the game of golf wherein each shoe includes a sole having a continuous exposed edge and a raised heel having a forward wall defining a part of the instep, the combination comprising:

a first attachment plate removably carried on said heel;

a second attachment plate removably carried on said sole in spaced relationship to said first attachment plate;

each of said plates having a plurality of clamping means arranged in spaced apart relationship along the peripheral edges of said plates and extending into frictional engagement with opposing portions of the edge of said sole;

a plurality of spikes carried on the underside of each of said plates adapted for ground engagement when said plates are affixed to said sole by said clamping means;

said clamping means comprising a pair of extensions arranged transversely across said second attachment plate having a hook fixedly carried on their respective ends adjacent said peripheral edge;

adjustment screws interconnecting said extensions to said second plate for releasable securement thereto;

said extensions include parallel rails separated by an elongated slot accommodating passage of said adjustment screws;

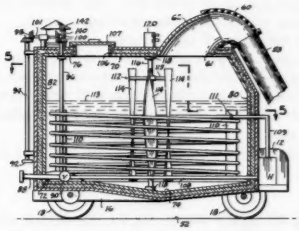
retainer nuts secured to said plate having a central raised portion extending through said extension slots serving as a guide for said extension during an adjustment procedure; and

said retainer nut includes an annular shoulder deformable with said plate so as to be upset and swagged into securement therewith.

3,866,340
SNOW REMOVER WITH SLURRY DISPOSAL

Eli G. Krickovich, P.O. Box 106, Clinton, Iowa 52732

Division of Ser. No. 231,292, March 2, 1972, Pat. No. 3,766,586. This application Oct. 12, 1973, Ser. No. 406,019
Int. Cl. E01h *5/10*
U.S. Cl. 37—12 **6 Claims**



1. A roadway cleaning apparatus in combination with a prime mover comprising a vehicle chassis having an engine control means thereon including a control cab and having a hydraulic fluid pump, the improvement comprising:

conveyor means transversely connected to the forward end of said chassis,

said conveyor means including a substantially cylindrical housing disposed horizontally adjacent the surface of the earth,

said housing having closed ends and having a coextensive downwardly and forward directed intake opening,

said housing having a rearward and upwardly directed discharge opening medially its ends,

a pair of cooperating coaxially aligned screw conveyors extending between and journalled by said housing ends, and impeller blades interposed between and connected, respectively, with adjacent ends of said screw conveyors medially the ends of said housing, the length of each said impeller blade being equal with the radius of said screw conveyors,

said screw conveyors being characterized by a helical edge portion generating a cylindrical plane coinciding with a circular plane generated by the outwardly directed limit of said thrower blades as the conveyors are rotated about their axis,

said helical edge portions and said impeller blades being arcuately curved toward the direction of rotation;

guide means including a planar panel coextensive with a longitudinally connected by one marginal edge to the upper limit of said housing rearwardly of its intake opening in forwardly and upwardly inclined relation;

a triangular shaped end member connecting the respective ends of said panel with the respective closed end of said housing;

drive means including belt and pulley drive means extending between and respectively connected with said prime mover and one end portion of one said screw conveyors for rotating said screw conveyors;

a rectangular fluid containing closed tank having a material receiving opening in its top wall and having inner and outer spaced-apart walls having heat and cold insulation therebetween mounted on said vehicle chassis rearwardly of and projecting above the horizontal plane defining the upper limit of said control cab;

a pair of shafts transversely journalled in coaxial aligned relation by the forward end portion of said chassis;

a pair of arms pivotally connected at one end portion, respectively, to the respective outwardly disposed end portion of the respective said shaft, the other end portion of said arms being pivotally connected, respectively, with opposing end portions of said housing;

a pair of braces projecting forwardly of said tank in laterally spaced relation above said housing;

a pair of pressure operated cylinders extending between and connected, respectively, with the forward end portion of said braces and opposing end portions of said housing for vertical pivoting movement of said housing about the horizontal axis of said shafts;

a discharge tube connected, at one end, with said housing around its discharge opening and extending rearwardly and upward, at its other end, and connected with said tank top wall around the receiving opening;

a heater mounted on said chassis;

piping connected with said heater and extending, intermediate its ends into said tank in spaced relation above the plane of the lowermost inner wall and being helically wound upwardly adjacent the inner periphery of said tank; and,

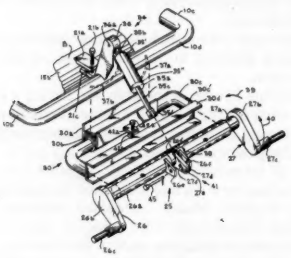
an antifreeze liquid filling said heater and said piping.

3,866,341

SCRAPER BUCKET WITH TILTABLE AXLE ASSEMBLY

Joe H. Fabrygel, Rt. 1, Box 424, West Columbia, Tex. 77486

Filed May 24, 1973, Ser. No. 363,474
Int. Cl. E02f *3/76*
U.S. Cl. 37—129 **20 Claims**



1. An earth moving device adapted for use in conjunction with a tractor or the like, comprising:

scraper bucket means for receiving and dumping earth, said scraper bucket means including means for attaching said device to a tractor or the like;

an axle assembly including first and second axle means having wheels mounted therein to rollably support said device, and means mounting said first and second axle means for relative rotational movement to a tilted position;

connect means mounting said scraper bucket means and said axle assembly for pivotal movement with respect to each other; and

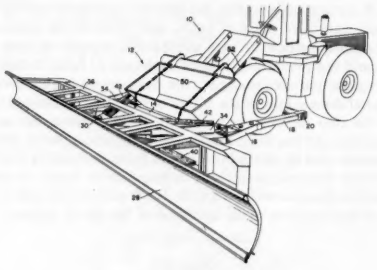
actuator means mounted with said scraper bucket means and said axle assembly for raising and lowering said scraper bucket means by effecting pivotal movement between said scraper bucket means and said axle assembly, said actuator means including limit means limiting pivotal movement between said scraper bucket means and said axle assembly and power means causing relative rotation between said first and second axle means to move said axle means and said scraper bucket means to a down, tilted position.

3,866,342

REVERSIBLE SNOW PLOW ATTACHMENT FOR WHEELED VEHICLES

George R. Cooper, Bullock Rd., R.D. 1, Slingerlands, N.Y. 12159

Filed Feb. 13, 1973, Ser. No. 332,180
Int. Cl. E02f *3/76, 3/62*
U.S. Cl. 37—117.5 **8 Claims**



1. A reversible snow plow attachment for a wheeled vehicle comprising;

pivotal connecting means on said vehicle arranged for pivotal motion about a transverse axis which is horizontal and located to the rear of the front wheels of said vehicle; a frame of generally U-shape extending across and in front of the vehicle and rearwardly to said connecting means along each side outwardly of the line of the front wheels, when they are fully turned, said frame being connected to said connecting means;

a mold board adapted for attachment to said frame in snow plowing position in front of said vehicle;

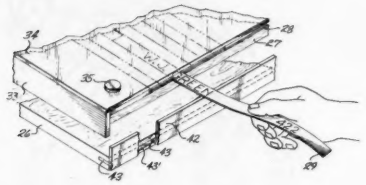
means for pivotally connecting said board to said frame to pivot about a vertical axis to a rearwardly oblique angle on either side of the vehicle; and

means for both bracing said board along its length and for restraining it against pivoting about a horizontal axis in relation to said support frame including a pair of bridge structures mounted on and extending along the rear face of the board, and sandwiching the frame for a substantial distance to the rear of the board when the board is in position on the frame.

3,866,343
INDICIA DISPLAY PANEL

William B. Frost, 1717 N.E. 99th N.E., Bellevue, Wash. 98004, and Edward N. K. Cooper, 1375 Marine Dr. S.W., Vancouver 14, British Columbia, Canada

Division of Ser. No. 85,518, Oct. 30, 1970, Pat. No. 3,751,836.
This application July 26, 1973, Ser. No. 382,923
Int. Cl. G09f *11/30*
U.S. Cl. 40—64 R 1 Claim

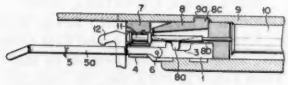


1. In an indicia display directory board including a facing component having a backing panel, an outer transparent sheet overlying the backing panel and means securing the transparent sheet and the backing panel in spaced relationship for defining a cavity between the outer face of the backing panel and the transparent sheet with an access slot formed between one edge portion of the backing panel and the overlying edge portion of the transparent sheet and communicating with such cavity, an indicia strip slidable edgewise out of such cavity through such access slot, a stationary component located behind the facing component with the backing panel of the facing component closer than the outer transparent sheet to the stationary component, and securing means connecting the facing component and the stationary component, the stationary component including a fixed panel, the improvement comprising a fixed slot-obstructing side flange carried by the fixed panel of the stationary component and projecting forward from the fixed panel toward the facing component and across the access slot of the facing component into a position overlapping the slot-forming edge of the transparent sheet for obstructing the access slot to prevent removal of the indicia strip therethrough, the securing means being operable to prevent sufficient bodily movement of the facing component away from the stationary component to remove the facing component access slot from registration with and obstruction by said fixed slot-obstructing side flange, and the securing means being releasable for movement of the facing component relative to the fixed component sufficiently to remove the facing component access slot from being obstructed by said fixed component fixed slot-obstructing side flange.

3,866,344
LOCK DEVICE OF A SHOT GUN

Takeji Kawamura, 1099-11, Ishinazaka-machi, Hitachi-shi, Ibaragi-ken, Japan

Filed Aug. 7, 1973, Ser. No. 386,291
Int. Cl. F41c *11/06*; F41d *3/00*
U.S. Cl. 42—16 4 Claims

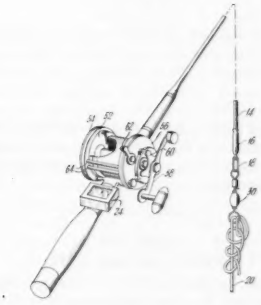


1. In a lock device for a shot gun having a breech bolt and adapted to block a cartridge from behind when firing, said lock device comprising a slide body slidably disposed along a barrel and a lock member operatively associated with the slide body and adapted to be swung in unison with the sliding movement of the slide body to cause said lock member to be engaged with an engaging recess provided in the barrel to permit the cartridge to be blocked from behind, the improvement wherein said slide body is provided with a pair of recesses disposed in its top surface and spaced apart from its front end surface; and said lock member is provided with paired first and second projections extending from its undersurface and an engaging projection provided on the top surface of the front end portion of the lock member and near the paired second projections, whereby the first paired projections are slidably shiftable from the forward end portion to the backward end portion of the recesses, said first paired projections acting as a fulcrum, cam and sole pivot point which is not fixed to the breech bolt, wherein the lock member rides on a top surface section of the slide body and near the front end of the slide body to permit the engaging projection to become engaged with the engaging recess provided in the barrel.

3,866,345
FISHING TACKLE

David P. Gagnon, East Sandwich, Mass., assignor to The Sippican Corporation, Marion, Mass.

Filed Aug. 10, 1973, Ser. No. 387,230
Int. Cl. A01k *91/00*
U.S. Cl. 43—4 4 Claims



1. Fishing tackle comprising a line having a pair of insulated conductors and a temperature responsive probe at an end of the line said probe comprising a thermistor electrically connected to said conductors; a link element for attaching a leader and lure to the probe, said link element being more susceptible to breakage than said line whereby said link is constituted as means preventing the loss of the probe on the application of tension to a leader attached thereto by breaking before the line breaks, one of said conductors at an end of the line remote from said probe being connected to ground and electrically connectable to one electrode of a battery and the other of said conductors at that end of the line remote from the probe being connected in series with a meter and connectable to the other electrode of said battery, said link being constituted as means preventing the elongation of said conductors beyond a predetermined limit which would result in an error signal at said meter.

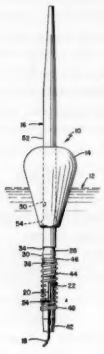
3,866,346
FISHING FLOAT

Vernon J. Schneider, Licking Pike, Alexandria, Ky. 41001

Filed July 13, 1972, Ser. No. 271,288
Int. Cl. A01k *93/00*
U.S. Cl. 43—44.87 14 Claims

1. A fishing float having a fixed line and a slip line condition, said float comprising: a stem, a buoyant member secured to said stem intermediate the ends thereof, an axial line receiving slot in said stem, said stem having a transverse lateral slot

opening thereinto, a spring mounted exteriorly about said stem and cooperating with said slot, said float having means thereon to provide one end of said spring with a first fixed axial position and a second fixed axial position relative to said



slot wherein the float is in a fixed line condition when said one end of said spring is in the first position and wherein the float is in a slip line condition when said one end of said spring is in the second position.

3,866,347

PEST CONTROL UNIT

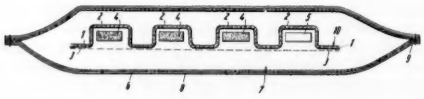
Werner Schoom, Bergen-Enkheim, Germany, assignor to Deutsche Gesellschaft fur Schadlingbekampfung GmbH, Frankfurt am Main, Germany

Filed Feb. 12, 1973, Ser. No. 331,891

Claims priority, application Germany, Feb. 11, 1972, 2206487

Int. Cl. A01m *19/00*

U.S. Cl. 43—129 **3 Claims**



1. A pest control unit comprising a tray having a plurality of recesses therein, a pest control material containing metal phosphides in at least one of said recesses of a type to generate a pest controling gas when subjected to atmospheric moisture, and a water soluble material in at least one other of said recesses, said water soluble material comprising a material selected from the group consisting of $Ca(OCl)_2$ $3H_2O$ and citric acid, chromic acid, sodium perborate with citric acid, potassium percarbonate with citric acid and sodium percarbonate with manganates, said material being chemically such that, upon the tray with the materials in said recesses being immersed in water, the water soluble material is dissolved and decomposes any residue of said pest control material to render it incapable of further generation of the pest control gas.

3,866,348

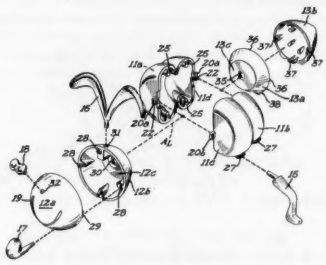
TOY INSECT

John H. Roby, Bloomington, and Roger R. Denlinger, Anoka, both of Minn., assignors to Kusan, Inc., Nashville, Tenn.

Filed Oct. 11, 1972, Ser. No. 296,667

Int. Cl. A63h *33/00*

U.S. Cl. 46—22 **7 Claims**



1. In a multiple section toy having a longitudinal axis with tabular means for joining the sections and wherein each of the sections are split into subsections adapted for releasable assembly, the improvement comprising

a longitudinally extending tab having a non-circular cross section integrally formed with at least one of the sections, said tab and said section being split into subsections along a longitudinal plane and wherein another of said sections is split in a plane transverse to the longitudinal axis having an aperture also transverse to the longitudinal axis with the same cross section as said tab, said tab being removeably received within said aperture whereby a rotational force can be applied to one of said sections relative to the other of said sections without forcing the subsections apart.

3,866,349

TRAP CONTAINING PHEROMONE

Geertruida M. Meijer, Delft; Fridolin J. Ritter, Waddinxveen; Albert K. Minks, Zetten; Simon Voerman, Wageningen, and Cornelis J. Persoons, Pijnacker, all of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Apr. 18, 1972, Ser. No. 245,199

Claims priority, application Great Britain, Apr. 27, 1971, 11634/71

Int. Cl. A01m *1/14*

U.S. Cl. 43—114 **4 Claims**

1. A trap for the summerfruit trotrix moth *Adoxophyes Orana* comprising:

a tunnel having an inner wall and at least one open end, said tunnel containing a mixture of cis-9-tetradecenyl acetate and cis-11-tetradecenyl acetate.

3,866,350

SOFT DOLL CONSTRUCTION

Adolph E. Goldfarb, Tarzana, Calif.; Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316, and Erin Libby, Hermosa Beach, Calif., assignors to said Benkoe, by said Goldfarb

Filed Feb. 21, 1973, Ser. No. 334,222

Int. Cl. A63h *3/20*

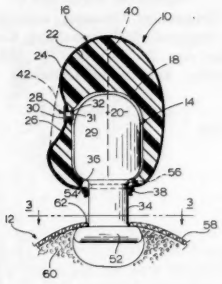
U.S. Cl. 46—161 **16 Claims**

1. A soft-head doll comprising:

a head suppot means comprising an upright neck portion and a bulb portion at the upper end of said neck portion, said bulb portion having a transverse dimension larger that that of said neck portion,

a three-dimensional soft doll head mounted upon said support means, said head being of soft and resilient construction,

said head having interior means defining a cavity in said head which has substantially the same size and shape as



said bulb portion so as to be essentially fully occupied by said bulb portion, said interior means defining an entrance into said cavity with a transverse dimension smaller than a transverse dimension of said cavity,

said transverse dimension of said bulb portion being larger than said transverse dimension of said cavity entrance.

3,866,351

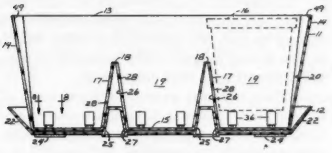
POTTED PLANT DISPLAY DEVICES

Barnell L. Cobia, Winter Garden, Fla., assignor to Green Island International, Inc., Winter Garden, Fla.

Filed May 25, 1973, Ser. No. 364,007

Int. Cl. A01g *27/00*

U.S. Cl. 47—38.1 **17 Claims**



1. In a potted plant display device the improvement comprising a molded receptacle of water impervious plastic for housing a plant pot and which has a water reservoir with an underlying horizontally oriented bottom wall, and means in the reservoir defining a plurality of uniformly oriented vertically extending capillary passages, said means including a molded support of water impervious plastic that is supported by and rises above said bottom wall for supporting a plant pot housed in the receptacle spacedly above said bottom wall, said molded plastic support having an upper surface that is arranged to contact the bottom wall of a plant pot supported thereon, and each of said capillary passages having inlet and outlet openings that are respectively located at said underlying bottom wall and said upper surface, said improvement further comprising a molded tray of water impervious plastic for containing water and which underlies said underlying bottom wall, and said receptacle having an overflow outlet located over said tray and spacedly above said upper surface.

3,866,352

HORTICULTURAL NONWOVEN SUBSTRATE AND SIDE MAT

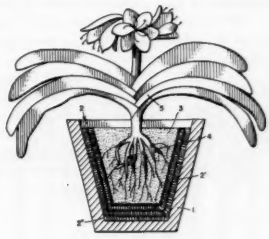
Wilhelm Herveling, Wuppertal; Alfred Birker, Neviges-Donberg; Siegfried Langefeld, Wuppertal; Berthold H. Daimler, Remscheid-Lennep; Gunter Fett, and Irmgard Dickersbach, both of Wuppertal, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 30, 1972, Ser. No. 310,981

Claims priority, application Germany, Dec. 2, 1971, 7145371

Int. Cl. D04b *3/16;* **A01g** *9/02*

U.S. Cl. 47—34 **5 Claims**



1. A horticultural nonwoven horizontal substrate combined with a substantially vertical nonwoven side mat, said substrate and said side mat being a unitary three-dimensional random fibrous nonwoven porous structure of rot-proof synthetic fibers forming a continuous aeration zone when placed beneath and around soil accommodating plant roots, said rot-proof fibers consisting essentially of a plurality of looped, intersecting and substantially amorphous filaments of melt-spun synthetic polymers bonded together at their intersection, wherein the surfaces of said mat and said substrate which are in contact with said soil have a lower porosity than the sides that do not contact said soil, said lower porosity being sufficiently low to prevent substantial penetration of soil into said aeration zone.

3,866,353

PROCESS FOR PRODUCING METHANE-RICH GASES FROM HYDROCARBONS

Hagen Krumm, Frankfurt, and Friedrich-Wilhelm Moeller, Seulberg, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 29, 1973, Ser. No. 392,722

Claims priority, application Germany, Mar. 24, 1973, 2314804

Int. Cl. C01b *2/14*

U.S. Cl. 48—214 **5 Claims**

1. Process for producing methane-rich gases by reacting vaporized hydrocarbons of the naphtha or kerosene-type being substantially free of sulphur compounds and having an upper boiling point of about 250°C with water vapor in the presence of a catalyst at elevated temperatures and under a pressure of from 15 to 100 atmospheres in two reaction zones, which comprises:

i. feeding a mixture of 40–50 percent by weight of preheated vaporized hydrocarbons with 80–90 percent by weight of the water vapor into a first reaction zone;

ii. cooling the product gas coming from the first reaction zone;

iii. thereafter mixing same with the remaining 60–50 percent by weight of preheated vaporized hydrocarbons and with the remaining 20–10 percent by weight of the water vapor and feeding the resulting mixture to a second reaction zone, thereby maintaining the temperature of the catalyst in both reaction zones in the range of 300°–500°C;

iv. the overall water vapor to hydrocarbons weight ratio being less than 1.4; and

v. the catalyst in both reaction zones containing more than 50 up to 60 weight percent nickel on a spinel ($MgAl_2O_4$) support.

3,866,354

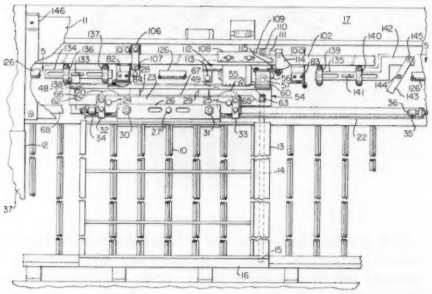
COMBINATION ELECTRICAL AND MECHANICAL SECURITY SYSTEM

Gerald L. Butt, Independence, Ky., assignor to Stewart-Decatur Security Systems Incorporated, Covington, Ky.

Filed Aug. 1, 1973, Ser. No. 384,608

Int. Cl. E05b *47/06*

U.S. Cl. 49—16 **10 Claims**



1. A combination electrical and mechanical security system for separate electrical and mechanical mode operation for remotely locking and unlocking selected sliding doors comprising electric motor and gear means associated with each respective door, mechanical actuation means independent of said electric drive means, mode control means operatively connected with said electric motor and said mechanical actuation means for determining the operational mode, a drop bar locking each door in the fully opened and fully closed position, a roller rotatably mounted to the upper end of said drop bar, and a carriage assembly associated with each respective door and operatively connected with said respective drop bar to unlock said drop bar in response to said respective electrical motor and said mechanical actuation means depending on the operational mode, said carriage assembly including a linear rack, said gear means connecting said electrical motor with said rack wherein activation of said electrical motor will drive said rack in a linear direction, a pair of roller receiving channels formed at each end of said rack, said channels being connected by a roller surface wherein when said roller is in one of said receiving channels said drop bar is in the locked position and when said roller is on said roller surface said drop bar is in the unlocked position, a cam surface forming one side of each of said roller receiving channels, a pair of linear lost motion slots formed in said rack, means connecting said rack through said lost motion slots with the door wherein movement of said rack a linear distance corresponding to said lost motion slots will cause the respective cam surface to urge said roller up said cam surface onto said roller surface thereby unlocking said drop bar, a bracket mount connected with said gear means, said bracket mount being pivotally secured relative to said rack, a pendulum for holding said gear means in engagement with said rack during the electrical operational mode, said pendulum engaging said bracket mount to prevent pivoting of said mount relative to said rack, mechanical links connected with said control means, a master bar mounted in parallel relationship to said carriage assembly and supported for sliding movement relative thereto, said master bar being connected with said mechanical links, and a cam member secured to said master bar, said cam member being operatively engagable with said pendulum and said bracket mount wherein movement of said mode control means to the mechanical operational mode portion will cause said cam member to pivot said pendulum away from said bracket mount and said cam member will engage said bracket mount to pivot said mount thereby disengaging said gear means from said rack.

3,866,355

WINDOW ASSEMBLY

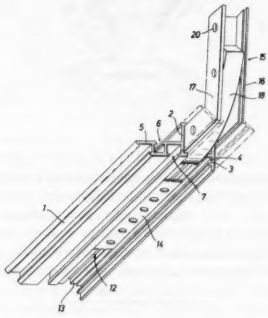
Gernot Jacob, Deggendorf, Germany, assignor to Gotz Metallbau GmbH, Deggendorf, Grosswalding, Germany

Filed Aug. 2, 1973, Ser. No. 384,955

Claims priority, application Germany, Aug. 7, 1972, 2238862

Int. Cl. E05d *15/52*

U.S. Cl. 49—192 **21 Claims**



1. A window assembly comprising:

a sash frame, said sash frame being comprised of metal and including a plurality of frame sections;

a window frame which cooperates with said sash frame to define the window assembly, said window frame being comprised of metal and including:

at least four transversely oriented elongated box sections, each of said box sections defining a guide track at a first external side thereof;

first flange means extending outwardly transversely from the second side of each of said box sections, said box section second sides being adjacent and oriented transversely to said box section first sides, said first flange means having at least a first groove which opens in the same direction as said guide track;

second flange means extending from each of said box section first sides in a direction transverse to said first flange means, said second flange means defining grooves which are adjacent and parallel to said guide tracks;

corner sections for joining transversely oriented box sections, said corner sections including arm means which are received in said box sections, said corner sections further including a curved surface defining element, said curved surface defining element forming a curved connection extension of the guide tracks on adjacent transversely oriented box sections;

at least a first fixed fitting mounted on one of said sash frame sections;

at least a first movable fitting mounted on one of said window frame box sections for cooperating with said fixed fitting;

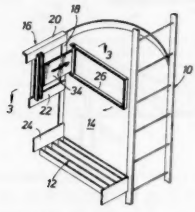
actuating means for said movable fitting, said actuating means comprising a flexible metal band extending about substantially the entire periphery of said window frame, said flexible metal band being disposed in the guide track defined by said window frame box and corner sections; and

lever means for imparting motion to said actuating means metal band.

3,866,356
SAFETY GATE

Hardy L. La Cook, and John H. Conklin, both of Houston, Tex., assignors to Fabenco Incorporated, Houston, Tex.

Filed Aug. 20, 1973, Ser. No. 390,022
Int. Cl. E05f *1/10*
U.S. Cl. 49—386 **7 Claims**

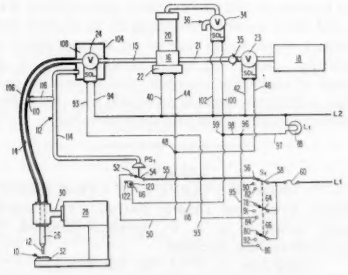


1. A safety gate for closing the opening in the guard rail of a walkway for a ladder, stairwell, or the like comprising a gate member, means for mounting the gate member for pivotal movement between a first position extending across such opening and a second position to allow passage therethrough, stop means for allowing the gate member to pivot in only one direction from the first position, said stop means including a first stop member mounted on one of the gate member and the gate member mounting means and a second stop member mounted on the other one of the gate member and the gate member mounting means to engage the stop means and hold the gate in the first position, said second stop means being movable sufficiently to allow the first position to be adjusted relative to the mounting means through an angle of about ninety degrees as required by the location of the opening, and resilient means urging the gate member toward the first position to maintain the gate member in the first position closing the opening to prevent passage therethrough in one direction when the gate member is not forceably held in the second position.

3,866,357
ABRADING APPARATUS

John William Callahan, Lanoka Harbor, N.J., and Martin John Capdevielle, Staten Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed June 6, 1974, Ser. No. 477,127
Int. Cl. B24c *9/00, 3/00*
U.S. Cl. 51—12 **4 Claims**



1. In abrading apparatus having a nozzle, delivery means providing a pressurized mixture of compressed gas and abrasive powder, and a conduit for conducting said pressurized mixture from said delivery means to said nozzle, wherein said delivery means includes a solenoid valve which when energized activates said delivery means and which when de-energized deactivates said delivery means, that improvement comprising:

a. a pressure-tight enclosure enclosing said conduit in at least partly spaced relationship to define a chamber therebetween;

b. a pressure-responsive switch including

1. a bellows connected to said enclosure in communication with said chamber whereby said bellows is extendable in response to a substantial increase of pressure in said chamber,

2. a switch connected in an electrical circuit with said solenoid valve to energize said solenoid valve in a first position of said switch, said switch being operably associated with said bellows for movement thereby to a second position wherein said solenoid valve is de-energized when said bellows is extended,

3. retaining means holding said switch in second position against return to the first position when said bellows is depressurized, and

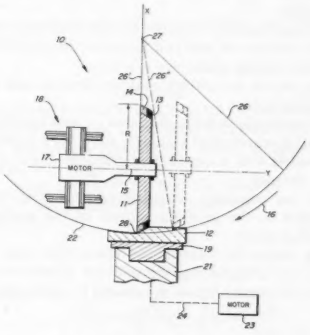
4. manual reset means operable for releasing said retaining means and returning said switch from second position to first position;

whereby a leak of said abrasive powder from said conduit is contained at least partly within said enclosure and said delivery means is deactivated when a leak occurs in said conduit.

3,866,358
METHOD AND APPARATUS FOR GENERATING TOROIDAL SURFACES

Wiktor J. Rupp, Lowell, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Aug. 2, 1973, Ser. No. 385,213
Int. Cl. B24b *7/00, 9/00, 1/00*
U.S. Cl. 51—33 R **9 Claims**



1. Apparatus for generating a toroidal surface on a workpiece comprising:

a. means for supporting a workpiece upon which said toroidal surface is to be generated;

b. means for supporting a surfacing tool adjacent said workpiece for generating said toroidal surface thereupon, said surfacing tool comprising a disc tool having a substantially annular peripheral surfacing face symmetrical about a central tool axis, the radius of said annular peripheral surfacing face being generally equal to the radius of the curvature to be generated in the direction of a first major meridian of said toroidal surface;

c. first drive means for transversely sweeping said tool and said workpiece relative to one another in a curved path having radius substantially equal to the radius of the curvature to be generated in the direction of a second major meridian of said toroidal surface; and

d. adjustment means for adjusting the orientation of said tool relative to said curved path for maintaining the radius of the curvature to be generated along said first major meridian of said toroidal surface substantially constant as the radius of said tool changes due to wear.

3,866,359

SURFACE GRINDING APPARATUS

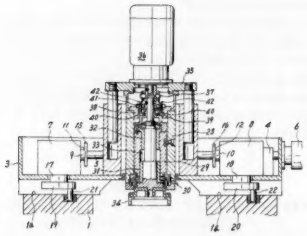
Makoto Kikuchi, Kariya, Japan, assignor to Toyoda-Koki Kabushiki-Kaisha, Aichi-Ken, Japan

Filed Mar. 25, 1974, Ser. No. 454,584

Claims priority, application Japan, Mar. 23, 1973, 48-33961

Int. Cl. B24b *7/00, 9/00*

U.S. Cl. 51—120 **4 Claims**



1. A surface apparatus for grinding a flat surface of a workpiece comprising:

a bed for holding the workpiece in a machining position, said bed being provided with horizontal hydrostatic slide surfaces:

a tool head slidably mounted on said horizontal hydrostatic slide surfaces of said bed for rotary movement in a horizontal circular path;

driving means for moving said tool head in said horizontal circular path;

a ram vertically slidably mounted on said tool head;

a grinding wheel shaft rotatably supported in said ram and provided with a cup-shaped grinding wheel at the lower end thereof;

means for angularly adjusting said grinding wheel shaft relative to the grinding surface of the workpiece in a vertical plane;

driving means for rotating said wheel shaft; and

means for vertically moving said ram relative to the workpiece to render infeed movement to said grinding wheel.

3,866,360

METHOD FOR BALANCE CORRECTING PNEUMATIC TIRES

Freydoun Monajjem, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 306,075, Nov. 13, 1972, Pat. No. 3,848,369. This application June 7, 1974, Ser. No. 477,242

Int. Cl. B24b *1/00*

U.S. Cl. 51—281 R **3 Claims**

1. A method of balance correcting a pneumatic tire comprising the steps of:

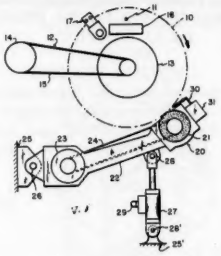
A. determining a point of imbalance in a pneumatic tire;

B. positioning a reflective material on the tire in reference to the point of imbalance;

C. rotating the tire;

D. directing light from a light source onto the tire and reflecting light from the reflective material on each revolution of the tire;

E. generating an electrical signal with light reflected by the reflective material; and



F. actuating a grinding means to selectively remove a predetermined amount of rubber from the tire at the point of imbalance by the generated electrical signal.

3,866,361

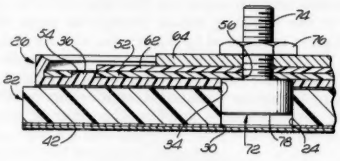
REPLACEABLE PAD ASSEMBLY

Harold R. Mauck, Woodland Hills, Calif., assignor to Standard Abrasives Incorporated, Northridge, Calif.

Filed Aug. 22, 1973, Ser. No. 390,642

Int. Cl. B24d *17/00*

U.S. Cl. 51—358 **3 Claims**



1. A replaceable pad assembly comprising:

a body of resilient material having a first side face and a second side face;

means for securing an abrasive finishing article to one of said side faces; and

a generally planar drive disc having one surface secured to the other of said side faces and a second surface having drive bosses integrally formed thereon for enabling said assembly to rotate with a drive member having openings into which said drive bosses are inserted;

means formed on said drive disc for securing said drive disc to said drive member consisting of an annular inwardly-directed retaining lip formed on the periphery of said drive disc chamfered for facilitating insertion and removal of said drive member, said drive disc periphery being sufficiently flexible to enable said drive disc to be rapidly separated from said drive member.

3,866,362

LAWN MOWER SHARPENING ATTACHMENT

Allan Riach, Ayton, and Thomas Sinclair, Eyemouth, both of England, assignors to P. D. Springall Limited, Henlow Camp, Bedfordshire, England

Filed July 11, 1973, Ser. No. 378,121

Int. Cl. B24b *3/42*

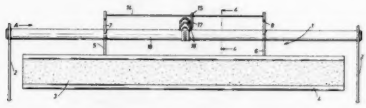
U.S. Cl. 51—250 **5 Claims**

2. In a sharpening attachment for a grass cutting machine of the rotating cylinder type having opposed side members interconnected by a tie bar and a plurality of blades rotatably mounted between the side members comprising an elongated frame, an abrasive element carried by said frame, and means for releasably securing the frame to the tie bar in a position

such that the abrasive element is disposed to sharpen the blades of the machine upon rotation of the blades, that improvement which includes

a. a plurality of arms secured to the back face of the frame and extending away from the frame,

each arm comprising a fixed part secured to the frame and an adjustable part angularly adjustable relative to the fixed part,



b. spring means interconnecting two of the adjustable parts,

c. means on each adjustable part for providing pivotal engagement on the tie bar, and

d. positioning means adjustably disposed on the tie bar intermediate the two adjustable parts for holding the spring means in a desired disposition such that in use the abrasive element, by suitable angular relationship of the arms, is brought into spring biased relationship with the blades of the machine.

3,866,363

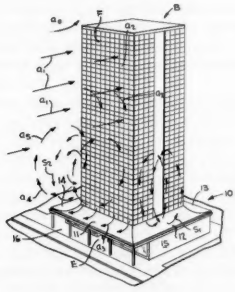
HIGH ENERGY WIND DISSIPATION ADJACENT BUILDINGS

James R. King, 6804 Capstan Dr., Annandale, Va. 22003

Continuation of Ser. No. 134,621, April 16, 1971, abandoned. This application June 21, 1973, Ser. No. 372,345

Int. Cl. E04b *1/34*

U.S. Cl. 52—29 **17 Claims**



1. In combination with a multi-story building having an outside entrance level and entrance opening and sufficient height and width above said entrance level to turn horizontally arriving natural winds into high energy downdraft along the face of the building, elongated wind deflector means extending substantially horizontally along at least one side of said building, said deflector means extending outwardly away from said face above said entrance level a distance sufficient to intercept and confine in substantially controlled single path flow the high energy downdraft winds, said deflector means extending at least substantially the full length of the side and extending substantially beyond the entrance opening along the side, said deflector means substantially integrally extending from said building, the downstream and lateral edges being disposed so as to finally direct the controlled flow to a height at least above the deflector means, whereby to deflect said controlled flow away from said entrance level to allow dissipation of said energy by vortex and eddy current effect and release of the air substantially free of said entrance level, said deflector means comprising a means curved so as to be substantially arcuate in cross section to generate vortex flow, the receiving edge of said curved means extending so as to merge smoothy with the face of said building and the downstream edge extending upwardly away from the entrance level at an angle greater than approximately thirty degrees with respect to a horizontal plane.

3,866,364

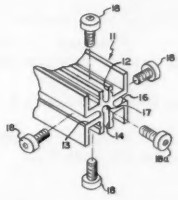
MODULAR STRUCTURE FOR USE IN MERCHANDISING OPERATIONS

Theodore O. Pollard, Palo Alto, Calif., assignor to International Product Development Incorporated, Palo Alto, Calif.

Filed May 10, 1973, Ser. No. 358,865

Int. Cl. E04b *2/82*

U.S. Cl. 52—36 **26 Claims**



1. In a modular structure a plurality of elongate members of constant cross section configuration having a plurality of longitudinal grooves on the sides thereof, said longitudinal grooves having smooth opposing side walls, joint means for interconnecting said elongate members, screws for forming threads on said smooth opposing side walls in predetermined ones of said grooves and for engaging and attaching said joint means to said elongate members, said screws extending into said predetermined ones of said longitudinal grooves and serving to prevent longitudinal movement of said joint means with respect to the elongate members, and panel means mounted in said longitudinal grooves forming a self supporting unitary upright structure.

3,866,365

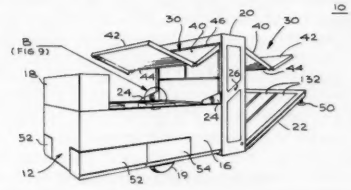
EXPANDABLE SPACE ENCLOSURE INCLUDING APPARATUS FOR ERECTING AND RETRACTING SAME

Michael L. Honigman, Los Angeles, Calif., assignor to Elm Design, Inc., Los Angeles, Calif.

Filed July 7, 1972, Ser. No. 269,848

Int. Cl. E04b *1/343*; **E04h** *1/12*

U.S. Cl. 52—70 **37 Claims**



1. Apparatus for erecting and retracting an expandable space enclosure comprising:

a box for storing folded roof and wall panels therein and having at least one open side which is covered in the storage condition by a floor section pivotably connected to the box, the roof panels comprising a pair of panels hinged together as a roof section for folded storage within the box, the inner panel being pivotably mounted to said box and having cantilevered erecting means adapted to rotate the roof section about the pivot support and main-

tain said section in unfolded horizontal position upon erection;

cable means for supporting and aligning said panels during movement of the panels between expanded and folded positions relative to the box;

at least one of said wall panels comprising an end wall movable translationally between parallel expanded and storage positions while maintained aligned in a fixed attitude during said movement by said cable means;

releasable means for maintaining said box in an upright attitude for the unfolding of the panels therefrom in order to provide an expanded space enclosure and for the retraction of said panels for storage within the box; and

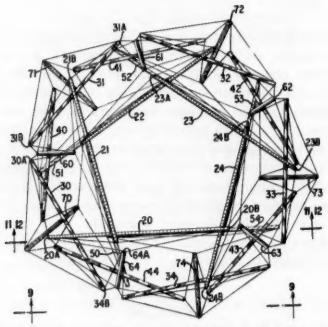
a control mechanism for unfolding the two roof panels relative to each other while the entire roof section is being rotated to the horizontal position relative to the box.

3,866,366

NON-SYMMETRICAL TENSION-INTEGRITY STRUCTURES

Richard Buckminster Fuller, 200 Locust St., Philadelphia, Pa. 19106

Filed Aug. 7, 1973, Ser. No. 386,302
Int. Cl. E04b *1/32*
U.S. Cl. 52—81 **7 Claims**



1. In a generally spherical-like building structure, the combination including a like pair of substructures, each being comprised of a plurality of column-like compression members and a plurality of tension elements, the column-like members being held in axially spaced relationship to one another by the tension elements being attached adjacent the ends of spaced column-like members, pentagon lesser circle configurations at the base of each substructure, and a plurality of column-like members between said substructures and extending directly therebetween and holding said substructures in spaced relation, said column-like members being held in axially spaced relation thereto by tension elements so that pentagon lesser circle configurations are displaced relative to each other.

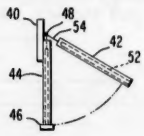
3,866,367

DEFORMABLE COUPLING

Richard A. Strizki, Ringoes, N.J., assignor to The State of New Jersey, Trenton, N.J.

Continuation-in-part of Ser. No. 151,285, June 9, 1971, abandoned. This application Jan. 3, 1973, Ser. No. 320,725
Int. Cl. E04b *1/00*
U.S. Cl. 52—98 **4 Claims**

1. An assembly embodying two horizontally spaced, vertically extending supports with a member extending therebetween and a shock absorber connected to said assembly to reduce the forces exerted upon said member upon relative movement of one of said supports with respect to said member, said shock absorber including two interengaging elements one of which is connected to said one of said supports and the other of which is connected to and movable by another member of said assembly, said interengaging elements being relatively movable and one of said elements being deformable by the other of said elements upon such relative movement.

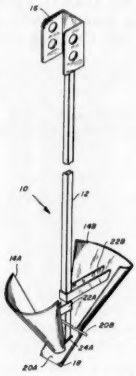


3,866,368

MOBILE HOME ANCHOR

Benny C. Toops, P. O. Box 2211, Tulsa, Okla. 74101

Filed Apr. 18, 1974, Ser. No. 461,844
Int. Cl. E02d *5/74*
U.S. Cl. 52—162 **6 Claims**



1. An earth anchor for anchoring structures such as mobile homes, comprising:

a. elongated shank means including head means at the lower end of said shank means;

b. coupling means at the top end of said shank means;

c. at least two fluke means at the lower end of said shank means supported by said head means;

d. each of said fluke means comprising:

1. base means including an opening adapted to slide along said shank means;

2. truncated semi-conical shaped sheet means attached at its smaller end to said base means so as to form a U-shaped fluke positioned with its base directed outwardly from said shank; and

3. tension means to restrain the outward movement of said shanks; and

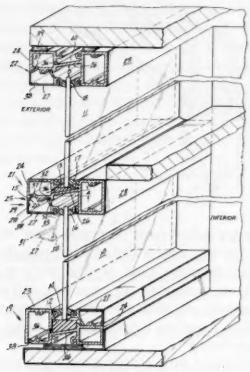
e. means to keep said at least two flukes positioned in opposite directions each from the other.

3,866,369

REVERSIBLE SILL ASSEMBLY WITH A POSITIVE FLUID DRAIN

David Paull, Big Rapids, Mich., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 21, 1973, Ser. No. 343,550
Int. Cl. E04b *1/343;* **EO6b** *7/14*
U.S. Cl. 52—209 **1 Claim**



1. A reversible sill assembly operable selectively in a first position to receive closure panels from an interior station and in a second position to receive closure panels from an exterior station which comprising:

A. a pair of spaced-apart tubular members;

B. an inclined web joining said tubular members operable to direct fluid in a predetermined direction which subtends an included angle with respect to the horizontal ranging from 3°to 15°;

C. a snap-on element detachably mounted on one of said tubular members and manually separable therefrom to facilitate insertion (reception) of panels; and

D. a drain system consists essentially of a plurality of fluid drain holes located in both of said tubular members communicating with said web operable to direct fluid distally away from said web, through said tubular members and out of said assembly; wherein said sill is reversible or rotatable through 180° about a horizontal axis to permit panel installation from said interior or exterior stations, as desired, and said inclined web remains operable to direct fluid in said predetermined direction in either of said positions.

3,866,370

ADJUSTABLE MODULAR PARTITION

Michael C. Guarino, Rumson, and Frank Cacossa, Livington, both of N.J., assignors to M. C. Guarino Associates, Inc., Belleville, N.J.

Filed Jan. 26, 1973, Ser. No. 327,609
Int. Cl. E04c *2/32*
U.S. Cl. 52—241 **21 Claims**

1. An adjustable modular partition comprising:

an inner layer of a first fire resistant and sound deadening material having opposing sides;

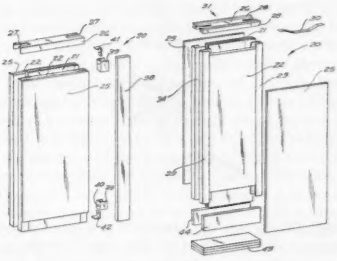
a second layer of a second fire resistant and sound deadening material on each side of said first material so that said first material is located therebetween;

a third layer of a third fire resistant and sound deadening material on the sides of said second material distal from said first material so that first and second material are located therebetween;

a fourth layer of a fourth fire resistant and sound deadening material on the sides of said third material distal from said second material so that said first, second and third material are located therebetween;

means for fastening said four layers together to form a partition module with high sound deadening and fire resistance qualities;

each of the opposed vertical sides of the partition module containing a vertical recess adapted to receive a portion of a vertical spline member therein, another portion of each spline member being positioned in a corresponding recess in another partition module to thereby interconnect adjacent partition modules to form a modular wall partition system of desired length;



at least the surfaces forming the vertical recess being covered by a rigid supporting channel for stiffening predetermined portions of the module and which is adapted to be resiliently deformed sufficiently for accommodation of dimensional differences in spline members and to frictionally engage with an appropriate spline member so as to facilitate formation of a modular wall partition system; and

adjustable means on said partition module positioned so that when said partition module is substantially vertically located between a floor and ceiling, the adjustable means can be shifted to provide engagement between the top and bottom of the partition module and the ceiling and floor respectively.

3,866,371

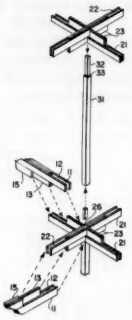
STRUCTURAL FRAMING SYSTEM

John Paul Rutherford Falconer, St. Louis, Mo., assignor to Midwest Housing Research Corporation, Jefferson City, Mo.

Filed Mar. 7, 1973, Ser. No. 338,663
Int. Cl. E04b *1/54;* **E04c** *1/04*
U.S. Cl. 52—281 **7 Claims**

1. Construction means for building low-cost easily assembled structures having joints with structural continuity and stiffness comprising: at least one beam having a stepped profile in side elevation, the middle being a full height section and at least one end portion being of reduced height, a groove extending vertically through the entire height of the end portion and longitudinally from said at least one end to the beginning of said full height section, the middle portion of the full height section being full width, and there being at least one reduced width portion longitudinally extending from said full width middle portion to the reduced height end portion; and at least two connectors also having a stepped profile in side elevation, the middle being a full height section and both end portions being of reduced height, a groove extending vertically through the entire height of the end portions and longitudinally from both ends to the beginning of the full height section, a portion of the full height section being of reduced width and the remainder being full width, a transverse vertical slot extending from the level of the reduced height end portions through said reduced width portion, which slot being in

the middle of the connector and having a longitudinal width equal to said full width; said two connectors being fitted transverse to each other with the slot of one fitting into the slot of the other and over the respective full width portions of the two connectors, and said beam fitting onto the end portion of one of said two connectors, the reduced width portion of the beam



frictionally fitting into the groove of the one connector and the reduced width portion of the one connector fitting into the groove of the beam so as to form a longitudinal extension of the connector with the beam, thereby forming a two-dimensional joint having structural continuity through the intersection point of two connectors.

3,866,372

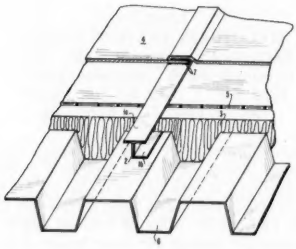
MOUNTING ELEMENT AND METHOD FOR A LOOSELY LAID SYNTHETIC RESIN FILM AND ROOF CONSTRUCTION CONTAINING SAME

Karl Haage, Troisdorf-Spich, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 18, 1973, Ser. No. 370,687

Int. Cl. E04c *2/50*

U.S. Cl. 52—309 **22 Claims**



1. A mounting apparatus for synthetic resin films loosely laid on a layer of thermal insulating material for heat-insulated roof construction which are ungraveled comprising, as seen in cross section, a T-shaped element, a mounting flange unilaterally arranged at the base of the T at right angles, a bottom structure joined to and supporting the mounting flange of the T-shaped element, and heat insulation foamed onto the bottom structure and onto said flange and T-shaped element so that the upper surface of the T-shaped element remains uncovered by insulation whereby the uncovered upper surface of the T-shaped element provides a broad surface to which a loosely laid roof sheathing can be bonded.

3,866,373

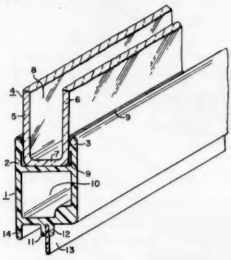
PULTRUDED SHAPES CONTAINING HOLLOW GLASS OR CERAMIC SPHERES

John S. Hudock, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 6, 1972, Ser. No. 269,337

Int. Cl. E04c *2/38*

U.S. Cl. 52—309 **7 Claims**



1. A pultruded window sash comprising an inelastic elongated member having two substantially parallel elongated arms for grasping window glass, a void portion forming an elongated cavity, an elongated leg opposing one of said arms, and two substantially parallel elongated extensions adjacent said leg for holding a sealing strip, said sash being constructed of materials comprising

1. about 35 to about 60 percent solventless polyester resin composition about ½ to about 2 percent of which is a catalyst,
2. about 1 to about 5 percent internal mold release,
3. about 40 to about 65 percent glass material selected from the group consisting of roving, cloth, and mixtures thereof
4. hollow spheres selected from the group consisting of glass, ceramic, and mixtures thereof, where said spheres replace a portion of said glass material equal to about 3 to about 6 percent of said sash.

3,866,374

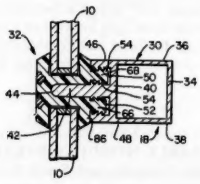
PANEL MOUNTING SYSTEM

John A. Dallen, Port Clinton, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Oct. 5, 1972, Ser. No. 295,258

Int. Cl. E04b *1/66;* **E06b** *3/62*

U.S. Cl. 52—400 **5 Claims**



1. A glazing system for providing structural rigidity between adjacent construction panels of a building wall structure wherein a pair of said panels are disposed above one another in a generally coplanar relationship, the adjacent horizontal edges of said pair of panels being closely spaced to each other, said glazing system comprising:

an elongated rigid structural member affixible to said building structure to extend generally coextensively with said adjacent horizontal panel edges, said structural member including a rigid horizontally extending load bearing protrusion projecting outwardly therefrom generally normally to the plane of said panels and having an outer end spaced from said structural member, and a horizontally

extending gasket receiving channel on each side of said protrusion, both of said channels opening outwardly toward said plane of said panels and extending generally coextensively with said protrusion,

an elongated elastomeric panel mounting and sealing gasket including first and second portions, said first portion comprising a body portion having horizontally extending panel receiving channels opening vertically therein, said second portion including means received in each of said gasket receiving channels for releasably affixing said gasket to said structural member, and a groove to receive said load-bearing protrusion, said groove extending from said second portion into said first portion and between said panel receiving channels, said panels in said panel receiving channels having coplanar outermost faces with respect to said structural member, and said outer end of said protrusion being spaced from said structural member for said protrusion to extend between said panel edges from the plane of said outermost faces toward said structural member.

3,866,375

LOUVRED CONSTRUCTION

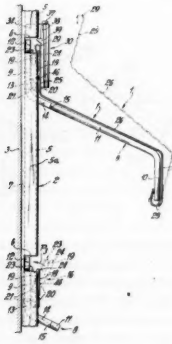
Johannes Antonius Henricus Brugman, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Willemstad, Curacao, Netherlands Antilles

Filed Apr. 10, 1974, Ser. No. 459,806

Claims priority, application Netherlands, Apr. 10, 1973, 7304969

Int. Cl. E04b *7/16*; **E06b** *7/08*

U.S. Cl. 52—473 **18 Claims**



1. A louvred construction of the type described comprising a channel support, at least one rib, said rib having one end portion thereof disposed within said channel support, a locking member for securing said one end of said rib within said channel support, said rib extending outwardly from said channel support and terminating in an outer edge, an elongated panel, means for securing one longitudinal edge of said panel to said outer edge of said rib, the other longitudinal edge of said panel being engaged with said locking member, and clamping means slidably engaged in said channel support for clamping a portion of said panel adjacent said other edge between said locking member and said clamping means.

3,866,376

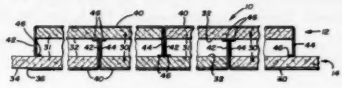
METAL CLAD GYPSUM WALLS

Nels Nelsson, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Oct. 5, 1972, Ser. No. 298,314

Int. Cl. E04b *2/62, 2/02*; **E04c** *1/30*

U.S. Cl. 52—493 **12 Claims**



1. In a demountable hollow wall assembly including two opposed, parallely extending, spaced-apart rows of panels, each row assembled independently of the other, the panels of at least one of the rows each being provided with a core having a front surface and a back surface, and a metal sheet adhered to the front surface; the improvement wherein said sheet includes an edge portion integral with said sheet along a vertical margin of said sheet which depends out of the plane of said sheet along the edge of said core and extends inwardly of said wall to a point beyond the back surface of the panel it covers, said edge portion being in releasible contact engagement with the back surface of a panel of the opposite row, and runner means at both the upper and lower ends of said panels providing lateral restraint for maintaining the inner walls of said panels in engagement with edge portions of opposite panels, whereby said panels are supported in spaced-apart position in the absence of separate studs.

3,866,377

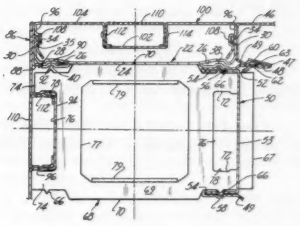
WALL PANEL SPACER

Camiel R. De Schutter, Saint Clair Shores, Mich., assignor to Perfect Module Systems, Inc., Mt. Clemens, Mich.

Filed Apr. 23, 1973, Ser. No. 353,653

Int. Cl. E04b *2/30*

U.S. Cl. 52—508 **5 Claims**



1. In a wall panel system comprising a plurality of wall panel sections connected in an end to end fashion by panel joints, a spacer member disposed within said panel system to maintain selected opposing components of said system in a predetermined spaced relationship, said spacer member comprising a body section having opposing parallel edges, two pairs of opposed spaced arms extending outwardly from said body portion in said direction as said parallel edges; the outer edge of each of said arms being provided with a rib adapted to engage components of said panel system in a snap lock fashion, each of said ribs being inwardly spaced from said body portion parallel edges; each of said pairs of extended arms defining thereinbetween a recess and the inner opposing surfaces of each of said pair of said arms having a groove formed therein for engaging in a snap lock fashion with a component of said wall panel system; the body section being provided with a central aperture of sufficient size to facilitate the passage of wiring and conduits therethrough; the side walls of said aperture adjacent said body portion being bent outwardly in

the same direction to define tab means, said tab means being inwardly spaced from said parallel edges and being disposed along an axis paralleling the edges of said body portion.

3,866,378

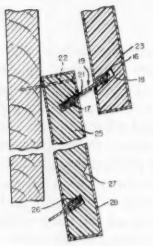
SIDING WITH LOOSE PLASTIC FILM FACING

Gerald Kessler, 388 Cranberry Rd., Boardman, Ohio 44512

Continuation-in-part of Ser. No. 187,960, Oct. 12, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,145

Int. Cl. E04d *1/10, 1/20*

U.S. Cl. 52—519 **7 Claims**



1. a. Architectural siding board for the exterior wall surface of a building comprising

b. a siding backerboard having a weather surface which is normally exposed when the siding is installed in place on a building structure to provide overlapping courses,

c. a film of flexible plastic sheet material secured to said backerboard only at unexposed locations on the siding,

d. said film lying unadheredly against and in direct contact with the backerboard at all surfaces which are exposed to the weather when the siding is installed, said film being of soft, non-rigid material smoothly stretched over the exposed surface of the backerboard and having sufficient elasticity to resume its smooth appearance even when the siding is struck sufficiently hard to dent the backerboard beneath the film.

3,866,379

TILE ASSEMBLY

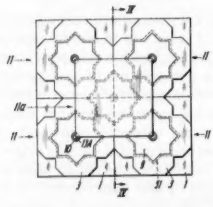
Heinz Paulke, Luebbecke No. 237, 4995 Levern Kreis, Germany

Filed Feb. 1, 1973, Ser. No. 328,629

Claims priority, application Germany, Feb. 3, 1972, 2205004

Int. Cl. E04c *1/10, 1/30*

U.S. Cl. 52—593 **10 Claims**



1. In a tile assembly, a combination comprising at least three identical tiles, each of said tiles being composed of three superimposed and interconnected layers, the first and second layers of each respective tile surrounding the third layer thereof and having portions extending outwardly beyond the latter so that said three layers of the respective tile define with one another a slot having a width approximating the thickness of said second layer, each respective layer being composed of four quarter-sections of predetermined shapes, the shape of the quarter-section of said second layer substantially corresponding to the shape of said portion of said first layer which extends outwardly beyond said third layer, said first layer having an exposed surface and a circumferential surface bounding said exposed surface, a first and a second of said tiles being situated adjacent to one another so that the respective circumferential surfaces of said first and second tiles abut one another and said exposed surfaces thereof face in one direction, the third tile being interfitted with said two tiles so that said exposed surface thereof faces in the opposite direction, one quarter-section of said third tile being interfitted with a quarter-section of said first tile and another quarter-section of said third tile being interfitted with a quarter-section of said second tile so that the respective quarter-sections of said second layer of said third tile extend into the associated slots of said first and second tiles and engage the associated quarter-sections of said third layers thereof and vice versa, whereby a four-layer structure is obtained, two outer layers of said structure being formed exclusively by the first layers of the respective tiles and the two inner layers being formed by the interfitting second and third layers thereof, said first and second tiles restraining said third tile during the assembling and disassembling of the tile assembly to movement in only one predetermined direction parallel to said exposed surface.

3,866,380

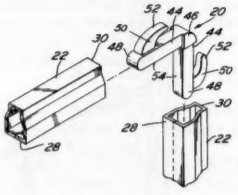
CONNECTOR FOR WINDOW SPACER ASSEMBLY

Henry Benson, Hialeah, Fla., assignor to Warren Industries, Hialeah, Fla.

Filed Apr. 2, 1974, Ser. No. 457,314

Int. Cl. E04c *2/54;* **F16b** *7/00*

U.S. Cl. 52—656 **6 Claims**



1. In a spacer assembly for spacing a pair of panes of glass from each other to form an insulated glass panel, said assembly comprising at least two elongated tubular spacers arranged to be secured together for disposition between said panes, each of said spacers comprising a wide integral planar inside wall, a narrow outside wall and a pair of side walls extending therebetween, said walls defining a hollow internal space, said space being of a predetermined cross-sectional area and including a major portion contiguous with said wide inside wall and a minor portion contiguous with said narrow outside wall and being of smaller cross sectional area than said major portion, the improvement comprising a connector for disposition within the interior of the spacers to securely connect the spacers together at a predetermined angle while enabling the spacers to deviate readily from said angle without loosening the connection between said spacers to thereby facilitate the construction of said panel, said connector being formed of a plastic material and comprising a pair of legs connected to each other at a junction and at said predetermined angle, each of said legs being adapted for disposition within said major portion of the interior of said spacer and being of such cross-sectional area so as to substantially fill said major portion and in contact with said wide inside wall thereof but not extending into said minor portion, each of said legs also including a free end from which a single, curved resilient finger projects back-

ward and into the minor portion of the interior of said spacer to contact the narrow outside wall thereof to thereby effect the frictional engagement of the interior of the spacer by said leg irrespective of manufacturing tolerances in the cross-sectional area of the spacer, the cross-sectional area of said junction being substantially smaller than the cross-sectional area of the interior of the spacer but of substantially the same cross-sectional area as that of each leg to enable the legs to flex from said predetermined angular orientation.

3,866,381

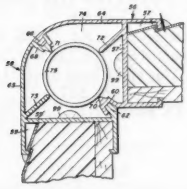
EXTRUDED COLUMNAR FRAME FOR PARTITIONS, WALLS AND ENCLOSURES

Robert C. Eschbach, Newport Beach, and John B. Colligan, Glendale, both of Calif., assignors to Aztec Manufacturing Company, Monrovia, Calif.

Division of Ser. No. 884,812, Dec. 15, 1969, Pat. No. 3,712,005. This application Jan. 22, 1973, Ser. No. 325,461

Int. Cl. E04b *2/78*

U.S. Cl. 52—731 **6 Claims**



1. A columnar frame member for a building structure, comprising

a first elongated half member having a first edge incorporating a first outwardly-turned trough flange carrying a first inwardly-extending projection and a second edge incorporating a first inwardly-turned locking flange, said first half member further including a second inwardly-extending projection extending from the inner surface of said first half member and spaced between said first projection and said first locking flange;

a second elongated half member complementary to said first half member and cooperating therewith to define a central cavity, said second half member having a first edge incorporating a second inwardly-turned locking flange adapted to interlock with said first trough flange, and a second edge incorporating a second outwardly-turned trough flange carrying a third inwardly-extending projection, said second trough flange being adapted to interlock with said first inwardly-turned locking flange, said second half member further including a fourth inwardly-extending projection extending from the inner surface of said second half member and spaced between said third projection and said second locking flange, said first, second, third and fourth projections extending into said central cavity when the respective first and second edges of said first and second half members are engaged; and

an elongated, removable, tubular holding member located within said central cavity and extending substantially the full length of said frame member, the outer diameter of said holding member being such that the external surface of the holding member contacts the inner ends of said projections and thereby secures said first and second half members in assembled relationship.

3,866,382

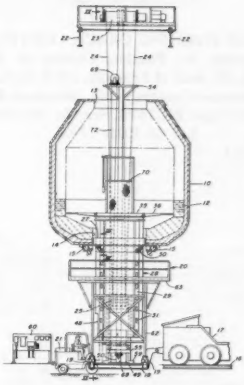
APPARATUS FOR SUPPORTING WORKMEN WITHIN AN OPEN-ENDED VESSEL AND CARRYING MATERIALS INTO AND OUT OF THE VESSEL, AND METHOD OF INSTALLING SUCH APPARATUS IN A VESSEL

Robert M. Van Tassel, Franklin, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 20, 1974, Ser. No. 444,197

Int. Cl. E04b *1/35;* **E04g** *21/16*

U.S. Cl. 52—741 **20 Claims**



17. A method of installing an apparatus in an open ended vessel, which apparatus provides support for workmen within the vessel and means for carrying materials into and out of the vessel, said method comprising:

positioning under the open bottom of the vessel a first handling and storage section which includes an upper tower section, tower-supporting means temporarily attached to said upper tower section, upper sections of guide means, and an elevator cage;

hoisting said first handling and storage section through the open bottom to a position in which tower-supporting means is at a level to be attached to the vessel adjacent the open bottom;

attaching said tower-supporting means to the vessel, whereafter said tower-supporting means engages and supports said upper tower section;

positioning under said first handling and storage section a second handling and storage section which includes a lower tower section, and middle sections of guide means;

joining said upper and lower tower sections;

joining the upper and middle sections of said guide means;

positioning under said second handling and storage section a third handling and storage section which includes a base plate and lower sections of guide means upstanding from said base plate; and

joining the middle and lower sections of said guide means.

3,866,383

METHODS OF GROUTING TILE

Frank E. Bernett, Yardley, Pa., assignor to Tile Council of America, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 363,858, May 25, 1973, abandoned, which is a division of Ser. No. 130,006, March 31, 1971, Pat. No. 3,735,545. This application Dec. 7, 1973, Ser. No. 422,835

Int. Cl. E04f *13/00*

U.S. Cl. 52—744 **16 Claims**

1. In a method of grouting tile which comprises the steps of:

a. trowelling a Latex-Portland cement grouting composition

on a tiled substrate and into the joints between the tile, said tile placed on said substrate;

b. removing excess grout from the tile faces;

c. washing the tile surface and shaping the joints to the desired configuration; and

d. cleaning the tile once the tile faces are dry; the improvement which comprises an additional step of applying to the grout after trowelling a material selected from the group consisting of polyacrylic acid, polyacrylamide, and water soluble phosphates which beneficially change the rheology of the grout subsequent to its placement between tiles.

3,866,384

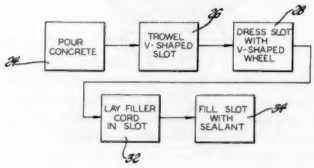
METHOD OF FORMING CRACK CONTROL SLOTS

Harry S. Peterson, Jr., Pontiac; Charles M. Peterson, and Robert King, III, both of Franklin, all of Mich., assignors to Harry A. Peterson Company, Inc., Highland Park, Mich.

Filed Sept. 25, 1972, Ser. No. 292,019

Int. Cl. E01c *11/06*

U.S. Cl. 52—744 **4 Claims**



1. A method of producing a concrete topping structure disposed over a foundation and having at least one sealed crack control slot formed therein and comprising the steps of:

a. Casting a topping layer of concrete over a suitable foundation;

b. Forming by tooling a V-shaped slot in and across the exposed surface of the topping layer while the concrete of said layer is in the unset plastic state;

c. Permitting the topping layer to substantially cure with the V-shaped slot formed therein;

d. Dressing the walls of the slot with a rotary abrading apparatus which conforms to the configuration of the slot to remove laitance and weak concrete from the slot while preserving the tooled configuration thereof, and

e. Thereafter sealing the slot by filling at least a portion of the slot with a curable flexible polymeric sealant material which, when cured, remains flexible and which adheres to the dressed concrete walls of the slot.

3,866,385

DEVICE FOR MANUFACTURING OF ROOFS

Saher Al Haj Issa, Bochum, Germany, assignor to Saher Al Haj Issa and Ali Abdulla Essa Almannai, both of Cologne, Germany

Filed May 31, 1973, Ser. No. 365,797

Claims priority, application Germany, June 2, 1972, 2226690

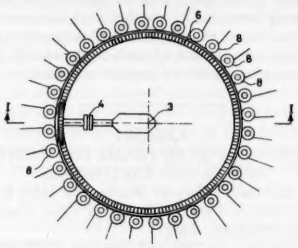
Int. Cl. E04g *21/16*

U.S. Cl. 52—749 **5 Claims**

1. In an apparatus for erecting a building structure from a plurality of building segments which are to be raised into position and locked together to form a composite building structure:

crane means disposed in operative association with the plurality of building segments to be raised into an erected building structure for raising a plurality of said segments into positions to form a raised multisegment portion of the building structure to be erected;

said crane means having, a plurality of take up means for taking up separate cable portions which are to operatively interconnect said respective take up means and said respective building segments for raising said respective



building segments into position in the erected composite building structure, and common drive means operatively associated with said plurality of take up means for driving said take up means from said common drive means.

3,866,386

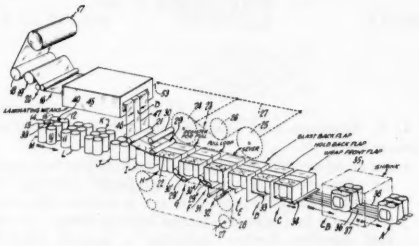
METHOD AND APPARATUS FOR MAKING A SHRINK PACK

Robert H. Ganz, 8 Ridge Crest Rd., Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 218,441, Jan. 17, 1972, Pat. No. 3,756,395. This application June 11, 1973, Ser. No. 368,527

Int. Cl. B65b *11/10, 53/02, 61/00*

U.S. Cl. 53—14 **15 Claims**



1. The method of packaging a cluster of plural like containers which comprises arranging the containers in parallel-oriented transversely aligned adjacency, selecting a length of shrinkable and bondable plastic sheet material of width exceeding the transverse extent of the cluster, forming a local relatively narrow pleat in the sheet material, said pleat extending in the length direction of the sheet, orienting the sheet material over the cluster at one end and both adjacent sides with the longitudinal ends of the sheet material overlapped at the other end of the cluster, and exposing the thus-wrapped cluster to a shrinking and bonding atmosphere for a predetermined period of time, such period of time being predetermined to assure bonded fusion of adjacent overlapped pleat and cluster-end surfaces to each other, as well as to assure concurrent shrink action of said material.

3,866,387

TRAY WRAPPING APPARATUS AND METHOD

Raymond A. Davis, Belmont, Calif., assignor to Frank A. Grant, Burlingame, Calif.

Filed July 5, 1973, Ser. No. 376,336

Int. Cl. B65b *7/28*

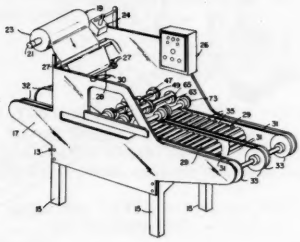
U.S. Cl. 53—42 **25 Claims**

1. A process for applying a flexible cover to a continuously advancing open tray having a peripheral flange defining a

leading lip, a trailing lip, side lips, leading corners and side corners, comprising:

a. positioning a sheet of flexible material over the advancing tray so that the margins of the sheet project beyond the flange of the tray;

b. folding downwardly at a folding station in one continuous motion the side margins, the leading margin and the trailing margin of the sheet adjacent the side lips, leading lip and trailing lip, respectively, of said flange;



c. tucking the side margins of the sheet below the side lips of said flange; then

d. tucking the leading margin of the sheet beneath the leading lip of said flange; and thereafter

e. tucking the trailing margin of the sheet beneath the trailing lip of said flange so that the tucked margins conform to the contour of the flange.

3,866,388

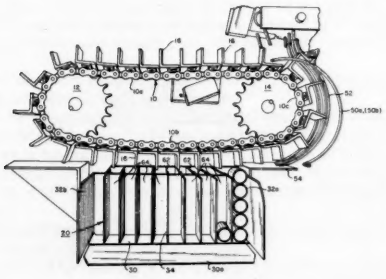
ROLL-BOXING APPARATUS

Herman J. Koehler, III, 64 Broad St., Elizabeth, N.J. 07201

Filed Jan. 11, 1974, Ser. No. 432,608

Int. Cl. B65b *57/20, 35/50*

U.S. Cl. 53—59 R **9 Claims**



1. Coin-roll boxing apparatus comprising, in combination, a continuously driven endless conveyor having upper and lower flights and incorporating means forming therewith individual roll-receiving open-mouth pockets which open downwardly throughout the length of the lower flight, means for supplying rolls to be boxed in number calculated to completely fill a box of a particular size in orderly one-at-a-time sequence to the open-mouth pockets of said lower conveyor flight from whence said rolls tend to fall by gravity, means for receiving the rolls falling from said pockets and for accumulating said rolls in a progression of discrete vertical rows, each containing a preselected small number of rolls, and power means actuable responsive to said so-supplied number of rolls having been accumulated as aforesaid for pushing same in unison from the accumulating means and into a box positioned and conditioned to receive same.

3,866,389

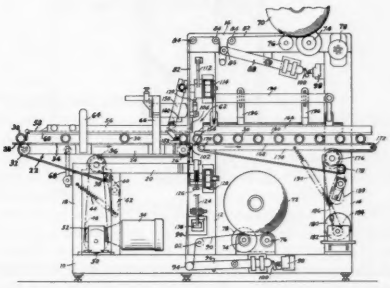
ROLL WRAPPING MACHINE

Bertram F. Elsner, and Frank Elsner, Jr., both of Hanover, Pa., assignors to Elsner Engineering Works, Inc., Hanover, Pa.

Continuation-in-part of Ser. No. 358,582, May 9, 1973, abandoned. This application Apr. 30, 1974, Ser. No. 465,676

Int. Cl. B65b *57/12*

U.S. Cl. 53—76 **14 Claims**

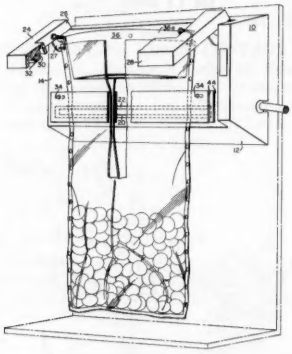


1. A machine for wrapping rolls of sheet material coiled about an axis as received from a re-winding machine and unrestrained against uncoiling, said machine comprising in combination, a frame, a first conveyor having an entrance and an opposite end supported by said frame and defining a path along which coiled rolls of material are advanced from said entrance, power means to move said conveyor along said path and away from said entrance, means operable as said coiled rolls are advanced along said path to rotate them in a direction to maintain said rolls in coiled condition, wrapper-applying mechanism including support means positioned to receive said coiled rolls of material from said first conveyor, means to apply loosely around each roll of material a heat-shrinkable wrapper positioned between the opposite ends of said rolls, means engageable with said rolls of coiled sheet material and operable to move said rolls onto said supporting means, wrapper sealing means operable while said rolls are on said supporting means to seal said wrapper axially along the length thereof to enclose each roll for the full length thereof, a second conveyor having a receiving end adjacent said wrapper-applying mechanism and defining a discharge path from said sealing means, means operable as said coiled rolls and enclosing wrapper are moved along said path by said second conveyor to rotate said rolls and wrapper continuously in a direction to maintain said rolls coiled within said wrapper, and heater means extending along the path of movement of said rolls upon said second conveyor at predetermined locations operable to shrink at least one or more portions of said loose wrapper into contiguous relationship with each roll to maintain the same coiled within said wrapper prior to subsequent shrinking of the entire wrapper into such contiguous relationship with the rolls.

3,866,390
APPARATUS FOR EVACUATING AND SEALING THERMOPLASTIC BAGS

William C. Moreland, II, Export, Pa., and Arie Van Dyck, Henderson, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1973, Ser. No. 345,811
Int. Cl. B65b *31/06*
U.S. Cl. 53—79 5 Claims



1. In an apparatus for evacuating air from a thermoplastic bag and subsequently sealing the mouth of said bag comprising:

evacuating means including a nozzle in fluid communication with a vacuum pump, said nozzle having spacially separated opposing walls joined at their ends to define a periphery for substantially air-tight engagement with the internal extent of said mouth; means for fusing opposing sidewalls of said bag together in sealing engagement to prevent leakage of air through said mouth, said fusing means including an electrically heated bar extending across and facing one wall of said bag and an opposing pressure bar extending across and facing the other wall of said bag, said two named bars being mounted for relative movement between a first position permitting the bag to be placed therebetween on said nozzle and a second position pressing the bag therebetween sub-adjacent said nozzle; and means interposed between said named bars and the respective adjacent wall of said bag to facilitate parting said fused portion of said bag from said fusing means wherein the improvement comprises:

said nozzle having a mouth engaging periphery describing a profile which is asymmetrial about any axis parallel to its major dimension, said nozzle further being tapered inwardly whereby said periphery thereof increases in the direction of moving said bag into said air-tight engagement.

3,866,391
WRAP-AROUND PACKER

Stanley J. Puskarz, Bristol, and Horst G. Lattke, Middletown, both of Conn., assignors to Emhart Corporation, Bloomfield, Conn.

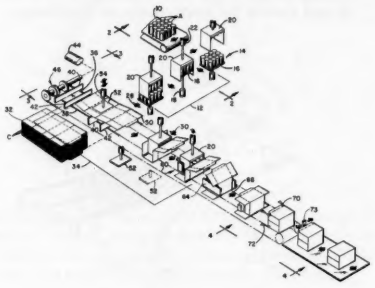
Filed Feb. 20, 1973, Ser. No. 333,453
Int. Cl. B65b *35/30*, *43/00*, *57/10*
U.S. Cl. 53—159 20 Claims

1. Apparatus for forming a box around an array of articles from an initially flap blank having a bottom panel, a pair of panels, said apparatus comprising:

a. means defining an article infeed station,

b. a vertically reciprocable structure above said infeed station defining means, said structure being of inverted U-shape,

c. a horizontally reciprocable carriage for said inverted U-shaped structure and movable in one direction to transfer the array of articles from said infeed station to a box



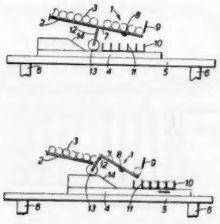
forming station defined alongside said article infeed station,

d. a vertically reciprocable mandrel at said box forming station for forming a flat blank into a generally U-shaped box open at one end to receive the array of articles so transferred.

3,866,392
PACKAGING APPARATUS

Reginald Arthur Weeks, Hail Weston, and Derek Stanley Cowling, Ramsey, both of England, assignors to Dufaylite Developments Limited, St. Neots, Huntingdonshire, England

Filed May 11, 1973, Ser. No. 359,259
Claims priority, application Great Britain, May 11, 1972, 22250/72
Int. Cl. B65b *5/10*
U.S. Cl. 53—160 11 Claims



1. Apparatus for feeding articles to packages of the kind which serve for locating the articles with respect to one another in a layer, which apparatus comprises a supply station for the articles, said supply station terminating in an outlet, a feeder having an entrance end and an exit end, a fixed gate member at said exit end, said feeder being privotably mounted for pivotal movement between an article-receiving position in which the feeder is in article-receiving relationship via its entrance end with the supply station outlet and a feeding position in which its exit end is lowered to allow progressive gravitational feeding of the articles under the fixed gate member and over the exit end, a manually slidable carrier for holding the packages in turn, means mounting said carrier for reciprocating movement, said carrier being reciprocably slid-

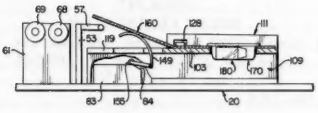
able manually to withdraw a package from a ready-position beneath the feeder through a filling stroke, during which the articles fed progressively over the exit end of the feeder are distributed over the package for location thereby, to a filled position, and subsequently to carry the next package to the ready position, and interengaging parts on the feeder and the carrier formed to pivot the feeder into its feeding position as the package is withdrawn from the ready position and to return the feeder to its article-receiving position as the next package is carried to the ready position, the pivotal movement of the feeder being manually powered via the carrier and said interengaging parts.

3,866,393

APPARATUS FOR FORMING DISPLAY PACKAGES

Ronald C. Warner, Ottawa Lake, Mich.; Bobby R. Shepherd, Toledo, Ohio; Ray M. Hickok, Toledo, Ohio, and Charles A. Alexander, Toledo, Ohio, assignors to Cameo, Inc., Toledo, Ohio

Filed May 7, 1973, Ser. No. 357,771
Int. Cl. B65b *43/00, 43/10*
U.S. Cl. 53—183 **8 Claims**



1. Apparatus for forming display packages of the type including a transparent blister containing a product to be displayed and a blister supporting card, said apparatus comprising:

support assembly means to support said card and blister while said display package is formed;

means for depositing the card, the blister and the product which fills the blister, onto said support assembly means, said card having first and second portions, one of which has an aperture therein for receiving the filled blister and the other of which serves as a backing sheet for the filled blister;

adhesive applying means for applying an adhesive composition to said card;

folding means for folding said first portion of said card over and onto said second portion thereof where said adhesive composition adheres said portions together to form the display package;

ejecting means for discharging the display package from said support assembly means;

an endless conveyor;

a plurality of said support assembly means mounted in a spaced relationship on said endless conveyor; and

drive means for continuously driving said endless conveyor so that said plurality of support assembly means mounted thereon continuously move past said means for depositing, and said adhesive applying means,

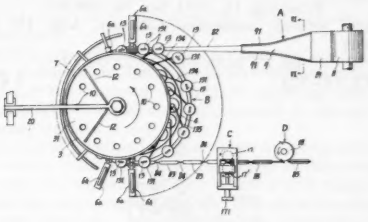
said folding means includes engagement means carried by each support assembly means for securing said card against each support assembly means and further includes elevating means carried by each support assembly means for elevating said first portion of said card.

3,866,394

HIGH SPEED PACKAGING DEVICE

Toshio Masai, No. 78 Tennojiya, Ohoza-Yao-shi, Osaka-fu, Japan

Filed Feb. 6, 1974, Ser. No. 440,080
Claims priority, application Japan, Feb. 6, 1973, 48-15053
Int. Cl. B65b *1/02*
U.S. Cl. 53—183 **9 Claims**



1. A high speed packaging device comprising:

a. means for feeding a heat sealable film to a rotary sealing-filling device from the direction of one tangent of the device by progressively folding the film longitudinally in half so as to make the upper open edges of the folded film face upwardly;

b. the rotary sealing-filling device comprising a rotary drum having a plurality of freely openable and closable plate-shaped sealers mounted at equal spaces thereon, a bottomed cylindrical hopper for feeding a material, said hopper being disposed on the upper part of said drum so as to be rotatable eccentrically and synchronously with respect to said rotary drum and having openings of predetermined size for the material to be filled formed at equal spaces along the circumferential edge of the bottom thereof, and a plurality of material dropping spouts disposed immediately below said openings and freely elevatably along the circumference of said rotary drum and being rotatable together with said rotary drum;

c. top sealers to continuously seal the top upper open edges of a chain of filled pouches pulled out from the tangential direction opposite to the direction of feeding said folded film by said rotary sealing-filling device, said sealers mounted on said rotary drum clamping the folded film fed from one tangential direction of the rotary drum in the position in which said film is fed, closing said film only during the period of time during which said film is transferred within the range of a certain arc of the circle described by the locus of rotational movement of said sealers, pulling and taking over said film and effecting vertical seals at equal spaces at right angles with the longitudinal direction of said film and keeping said folded film opened within the other remaining locus of rotational movement, said spouts moving down from above the open edges of said folded film before said film fed from the tangential direction of said rotary drum is caught by said sealers and brought into a fully folded shape, and being inserted into the interior of the film and being guided linearly together with said film to a position of point of contact between said film and said rotary drum, said openings of said hopper forming an inscribed circle with respect to a part of the locus of rotational movement of said spouts and said openings and said spouts overlapping with each other in a certain sector range within which said film is separated from the sealers after completion of said vertical sealing, said openings being opened only when the openings and the spouts are placed in an overlapped position and the spouts underlying said openings dropping and feeding the material to be filled into the interior of sealed pouches clamped by said sealers kept closed, said top

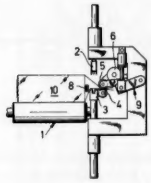
sealers being designed to pull and take over a chain of filled pouches left released from clamping by said sealers.

3,866,395

APPARATUS FOR CLOSING A FOIL PACKING, IN PARTICULAR A FOIL BAG

Karl-Ernst Timmerbeil, Ennepetal, Germany, assignor to Firma Packautomatic GmbH & Co. K.G., Ennepetal, Germany

Filed Aug. 16, 1973, Ser. No. 388,911
Claims priority, application Germany, Aug. 19, 1972, 2240909
Int. Cl. B65b *7/06, 13/22, 51/14*
U.S. Cl. 53—373 **6 Claims**



1. An apparatus for the tightening of a film package and the sealing of a side of the package enclosing an article on at least three sides and having a projecting flap on the side to be closed, said apparatus comprising:

a heat sealing device including

a support,

a first heat sealing bar mounted on said support for movement perpendicular to the longitudinal dimension of said bar,

a further bar cooperating with said heat sealing bar to clamp said flap between said bars, and

means for heat sealing said flap upon the clamping thereof between said bars and consituted by heating means on at least one of said bars; and

a pulling device engageable with said flap for drawing the film of said package tightly around said article, said device including

a first pulling roller mounted on said first bar for movement therewith,

a second pulling roller on said support copperating with said pulling roller to grip said flap between said rollers,

a swinging mechanism pivotally mounting said second roller on said support for movement toward and away from said first pulling roller,

an electric motor operatively connected to one of said pulling rollers for driving same, and

a respective gear on one side of each pulling roller and connected thereto, said gears meshing upon swinging movement of said second pulling roller toward said first pulling roller.

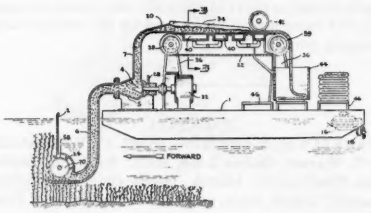
3,866,396

REMOVAL OF MARINE GROWTHS FROM LAKES, WATERWAYS, AND OTHER BODIES OF WATER

Dorman A. Meyer, 27 W. Third St., Apopka, Fla. 32703

Continuation-in-part of Ser. No. 141,539, May 10, 1971, abandoned. This application Dec. 7, 1972, Ser. No. 313,114
Int. Cl. A01d *45/08*
U.S. Cl. 56—9 **27 Claims**

1. Apparatus for removing marine growths from a body of water comprising a dual cutter assembly including a first partially enclosed rotary cutter, with an unenclosed portion of such cutter arranged to move in a generally downward direction, a second partially enclosed rotary cutter disposed below said first cutter, with an unenclosed portion thereof being arranged to move in a generally upward direction, stationary cutter blades located near the bottom of the path of travel of said first rotary cutter, and near the top of the path of travel of said second rotary cutter, means for moving the dual cutter assembly into an area of marine growths, and suction means applied to the enclosures around said rotary cutters for drawing such encountered growths to the exposed portions of the dual cutter assembly, so that the encountered growths can be



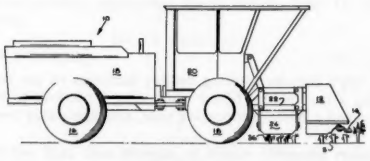
cut into short lengths by the coaction of said rotary cutters with the stationary blades, the upper rotary cutter drawing the growths downwardly and the lower rotary cutter drawing the growths upwardly, the suction means also serving to deliver to a remote location, the cut growths after they have been cut into short lengths by the coaction of the rotary and stationary cutters.

3,866,397

BRUSH ERADICATOR

Robert L. Koziol, 3200 Thomas St., Midland, Tex. 79701

Filed Nov. 27, 1972, Ser. No. 309,765
Int. Cl. A01d *35/12*
U.S. Cl. 56—16.8 **9 Claims**



1. In a brush eradicator including

a. a vehicle supported by

b. ground engaging wheels,

c. a power unit on said vehicle for driving same,

d. a cutter head on said vehicle,

e. knives on said cutter head for cutting brush,

f. linkage connecting said cutter head to said vehicle,

g. means operatively associated with said linkage for raising and lowering said cutter head,

h. The improvement in combination with the above comprising:

j. a spray head attached to said vehicle behind said cutter head,

k. said spray head including a plurality of flaps projecting below the spray head,

m. said flaps projecting to an elevation lower than the knives of said cutter head,

n. a plurality of spray nozzles on said spray head,

o. a source of herbicide under pressure,

p. a plurality of valves connected to said source of herbicide under pressure,

q. each of said flaps connected to one of said valves in operative relationship thereto,

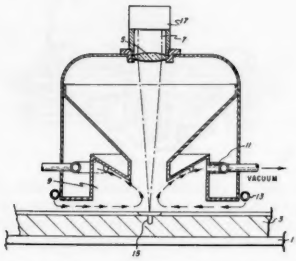
r. at least one spray nozzle connected to each of said valves,

s. said spray nozzle located proximate the flap which is connected to the valve.

3,866,398
IN-SITU GAS-PHASE REACTION FOR REMOVAL OF LASER-SCRIBE DEBRIS

Robert Donvin Vernon, Jr., and Robert E. Holloway, both of Sherman, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1973, Ser. No. 426,887
Int. Cl. H01l *7/50*
U.S. Cl. 156—17 **16 Claims**



1. A method of removal of laser-scribe debris, which comprises the steps of:

a. providing a device to be scribed,

b. directing a laser beam along predetermined points on said device to be scribed so that said beam impinges on said device,

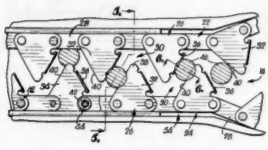
c. directing a reagent gas, which forms a volatile compound or a solid compound inert to said device with material from said device volatilized by said laser beam, to the immediate area of impingement of said laser beam on said device, and

d. continually removing gases from the immediate area of impingement of said laser beam on said device.

3,866,399
SEVERED CROP HANDLING MECHANISM FOR HARVESTERS

Ferol S. Fell, Newton; William D. Long, Hesston, and Kenneth R. McMillen, Moundridge, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Continuation of Ser. No. 114,308, Feb. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 86,767, Nov. 4, 1970, Pat. No. 3,736,733. This application Apr. 23, 1973, Ser. No. 353,350
Int. Cl. A01d *45/02*
U.S. Cl. 56—98 **4 Claims**



1. In a row crop harvester:

a pair of rolls adapted to feed severed stalks butt first to a stalk chopper behind the rolls;

a plurality of stalk-moving elevators declined forwardly from said rolls for receiving the severed stalks and directing the same butt first to said rolls,

each elevator including a single level only of side-by-side, endless, stalk-gathering members each having a series of triangular, bifurcated gripping lugs spaced apart to presend an alternate series of stalk-receiving cavities with the apexes of the lugs of one member projecting into the cavities of the other member,

each lug having a pair of superimposed, spaced-apart plates and being provided along one extremity with stalk-creasing means presented by the corresponding pair of spaced-apart edges of the plates,

each lug being provided at its opposite extremity with backup means for cooperating with the stalk-creasing edges of an adjacent lug to firmly clamp a stalk between said edges and the backup means during operation of the members;

means augmenting said holding action of the lugs including an inclined panel underlying each elevator respectively in parallelism therewith for slidably receiving said stalk butts while the stalks are held creased by the lugs and being elevated thereby,

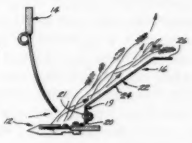
each pair of members having an upper, rearmost extremity wherein at least one member of the pair extends arcuately away from the other to define a point of stalk release; and means augmenting the action of the lugs of directing the stalks butt first to said rolls including a terminal portion on each panel respectively extending beyond said point of release of the stalks by the elevators to a point in close juxtaposition to said rolls,

said terminal portions being disposed to orient the stalks for movement butt first between the rolls after the stalks are released from the elevators and prior to pickup of the stalks by the rolls.

3,866,400
FEEDER PANEL FOR A HARVESTING MACHINE

Donald L. May, Garfield, Wash., assignor to J. E. Love Company, Garfield, Wash.

Filed Jan. 21, 1974, Ser. No. 435,000
Int. Cl. A01d *43/00*
U.S. Cl. 56—158 **8 Claims**

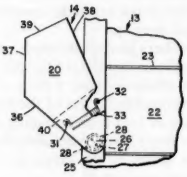


1. In a crop harvesting machine having a flexible cutterbar supported for travel over uneven ground and adapted to conform to the contours thereof, and a plurality of feeder panels connected to said cutterbar and disposed rearwardly therefrom, the improvement wherein each of said feeder panels is secured to said cutterbar by a plurality of hinges adapted to allow individual movement of each said feeder panel relative to said cutterbar as said cutterbar flexes and conforms to the ground contour, each feeder panel having a distinct hump in its forward portion proximate to said cutterbar over which the cut crop is tipped to provide quick removal of the cut crop from the vicinity of said cutterbar onto said feeder panel.

3,866,401
HARVESTING MACHINE WITH UNDER-VINE CLOSURE

Gerald L. Claxton, Lafayette, and Barris J. Evulich, Cupertino, both of Calif., assignors to Up-Right, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 292,084, Sept. 25, 1972, abandoned. This application May 30, 1973, Ser. No. 365,267
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 11 Claims



1. A harvesting machine comprising:

a main frame adapted to straddle and move longitudinally along a row of fruit-bearing plants,

a pair of conveyor mechanisms carried by said main frame and extending along the length thereof, one on each side of the longitudinal centerline of the machine, each conveyor mechanism having a frame and a conveyor belt carried thereby,

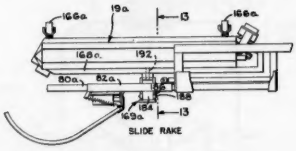
a closure assembly secured to the inner edge of each conveyor frame, said closure assemblies forming closure planes extending inwardly and upwardly from the conveyor frames towards the longitudinal centerline of said machine.

each closure assembly comprising a plurality of flat, overlapping wing members spaced along the conveyor frame associated therewith and lying in the closure plane associated therewith, each wing member being separately and pivotally mounted at one end thereof for confined movement of said one end of said wing member in said closure plane and for movement of the other end of the wing member in said closure plane towards and away from said longitudinal centerline, and spring means connected to and interposed between each of said wing members and said frame for yieldingly maintaining each such wing member in a normal space-closing position while allowing each wing member to pivot against the bias of said spring means from said normal space-closing position in a space-opening direction away from said longitudinal centerline and to pivot against the bias of said spring means from said normal space-closing position in an overtravel direction towards said longitudinal centerline, said spring means having a first positive spring rate effective to resist pivot movment of the corresponding wing member in said space-opening direction away from said normal position with a progressively increasing force as the increasing force as the degree of space-opening movement increases and also having a second positive spring rate effective to resist pivotal movement of said wing member in said overtravel direction away from said normal position with a progressively increasing force, said first spring rate being greater than said second spring rate.

3,866,402
SIDE DELIVERY RAKE SUPPORT

Donald P. Block, Orlando, Fla., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 248,221, April 27, 1972, Pat. No. 3,762,140. This application July 11, 1973, Ser. No. 378,087
Int. Cl. A01d *77/06*
U.S. Cl. 56—377 6 Claims

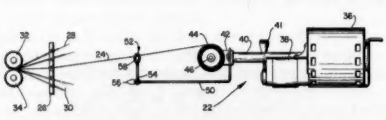


1. A windrowing machine for raking articles supported on an uneven surface into a windrow comprising: a mobile vehicle movable over said surface; means defining a rake support connected to said vehicle and extending transversely in a substantially horizontal position; an elongated rake disposed adjacent said rake support; wheel means connected to and partially supporting said rake; and mounting means connecting said rake to said rake support for vertical movement relative thereto in response to variations detected in the ground elevation by said wheel means for causing said rake to follow the undulations of said article supporting surface; said mounting means including means defining a parallelogram linkage having an upper link pivoted to said rake support and to said rake, and a lower link parallel to said upper link and pivoted to said rake support and to said rake.

3,866,403
UNTWISTING MECHANISM

Ernest H. Zimmermann, Jr., Webster, Mass., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 29, 1973, Ser. No. 410,955
Int. Cl. D01g *1/06*
U.S. Cl. 57—1 UN 24 Claims



9. An apparatus for untwisting a twisted continuous filament tow wound upon a spool comprising:

first means for producing rotation about a first axis;

second means attached to said first means for maintaining the longitudinal axis of said spool at an angle to said first axis;

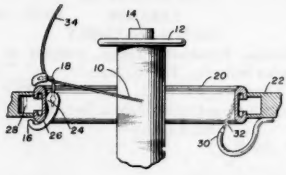
wherein said spool is mounted on said second means for rotation with said second means about said first means; and

means for controlling the relative rotations of said first and second means to provide a substantially open and loose filament tow band.

3,866,404
RING ASSEMBLY

Jack Doleman, West Melbourne, and William H. Hills, Melbourne, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 10, 1974, Ser. No. 433,023
Int. Cl. D01h *7/52, 7/62*
U.S. Cl. 57—119 **15 Claims**



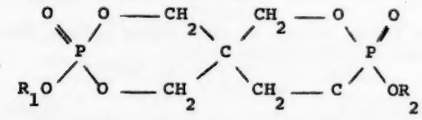
1. A ring twister assembly comprising a ring support, a metallic ring mounted thereon, means for lubricating the said ring and means for force circulating a heat transfer liquid in thermally conductive contact with the said ring.

3,866,405
BLEND OF FLAME-RETARDANT POLY (ETHYLENE-2,6-NAPTHALENE DICARBOXYLATE) FIBERS AND FLAME-RETARDANT CELLULOSIC FIBERS

William N. Knopka, Wilmington, Del., assignor to FMC Corporation, Philadelpia, Pa.

Filed July 18, 1973, Ser. No. 380,345
Int. Cl. D02g *3/04*
U.S. Cl. 57—140 BY **10 Claims**

1. Flame-retardant yarns and fabrics of a combination of (1) fibers of a saturated polyester resin of at least 75 mol percent ethylene-2,6-naphthalene dicarboxylate units and up to 25 spirophosphate mol percent of other ester units and an aryl spitophosphate of the formula



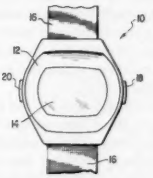
wherein R_1 and R_2 represent aryl radicals selected from the group consisting of phenyl, naphthyl, phenyl and naphthyl radicals containing 1 to 3 chlorine or bromine atoms, and further substituted derivatives thereof the substituents being selected from the group consisting of lower alkyl, lower alkoxy, phenyl, phenoxy and phenyl or phenoxy radicals containing from 1 to 5 chlorine or bromine atoms, said spirophosphate being mixed with said polyester resin in an amount sufficient to increase the flame-retardancy thereof; and (2) flame-retardant cellulosic fibers, the polyester fibers being present in an amount of from about 10 to 90 weight percent and the cellulosic fibers being present in an amount of from about 90 to 10 weight percent.

3,866,406
SOLID STATE ELECTRONIC WRISTWATCH

Dennis A. Roberts, Washington Boro, Pa., assignor to Time Computer, Inc., Lancaster, Pa.

Division of Ser. No. 328,639, Feb. 1, 1973, Pat. No. 3,803,827.
This application Oct. 16, 1973, Ser. No. 406,941
Int. Cl. G04b *19/24, 37/00, 27/00*
U.S. Cl. 58—4 A **3 Claims**

1. A wristwatch comprising a wristwatch case having a front window and a removable back plate, a one-piece frame of electrical insulating material in said case having one side adjacent said back plate and its other side adjacent said window, said frame including cavities on said one side, a trimmer capacitor in one of said cavities, the other of said cavities being adapted to removably receive a battery, a substrate mounted on said other side of said frame, an electro-optical display comprising a plurality of light-emitting diode digital display stations, a time computing circuit comprising at least a minute counter and an hour counter and a calendar circuit, said display, time computing circuit and calendar circuit all being on said substrate, both said time computing circuit and said calendar circuit being formed as large scale integrated circuits and coupled to said display, said frame including four additional cavities, magnetic field responsive reed switches in

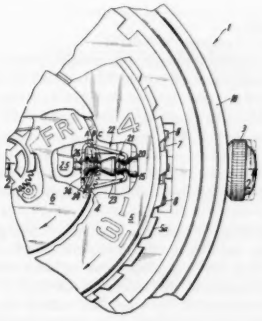


each of said four cavities, said switches comprising a time demand switch for coupling said time computing circuit to said display, a date demand switch for coupling said calendar circuit to said display, a minute set switch for setting said minute counter, and an hour set switch 2 for setting said hour counter, a pushbutton on said case adjacent each of said time demand and date demand switches for actuating them, a first permanent magnet receiving identation on said back plate adjacent said minute set switch, and a second permanent magnet receiving identation on said back plate adjacent said hour set switch whereby insertion of a permanent magnet into one of said indentations actuates the adjacent switch.

3,866,407
STEM LOCKING MECHANISM FOR ELECTRIC CALENDAR WATCHES

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 25, 1974, Ser. No. 463,947
Int. Cl. G04b *19/24, 27/02*
U.S. Cl. 58—58 **3 Claims**



1. In a watch of the type having a calendar ring with means for circumferentially advancing the ring from one position to the next during normal timekeeping and further having a time setting wheel with teeth and further having a rotatably

mounted and axially slidable stem carrying a time setting pinion mounted for engagement with said time setting wheel in a first axial stem position, and also having a fixed stem bracket receiving one end of the stem and having means cooperating with the stem to hold it either in said first axial position or to urge it toward a second axial position where the time setting pinion is disengaged from the time setting wheel, the aforesaid elements being known in the art, the improvement comprising:

a date setting member adapted to be coupled to the stem and having at least one tab means thereon engageable with said calendar ring to advance it to a new circumferential position, said member further being disengageable from the stem when it is moved to said first axial position, said stem having locking key means thereon and said stem-receiving portion of said stem bracket having an irregular aperture therein for receiving said locking key and preventing rotation when the stem is in said second axial position, and

cam means formed by the wall of said aperture to cause the stem to move to a third intermediate axial position without engaging the time setting wheel or disengaging the date setting member, whereby the date may be rapidly advanced by rotation of the date setting member.

3,866,408

TIMEPIECE SETTING MECHANISM

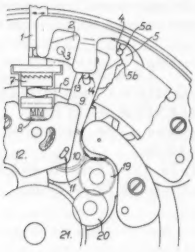
Jean-Pierre Gerber, La Chaux-de-Fonds, Switzerland, assignor to Zenith Time S.A., Le Locle, Switzerland

Filed Feb. 14, 1974, Ser. No. 442,345

Claims priority, application Switzerland, Apr. 4, 1973, 4796/73

Int. Cl. G04b *27/02, 27/00*

U.S. Cl. 58—63 **2 Claims**



1. In a watch:

hour indicator means;

a pull-out winding stem settable in a first pushed-in position for winding, a second pulled-out position for time-setting; and a third intermediate position; lever means settable by said shaft in first, second and third positions corresponding respectively to the first, second and third positions of said stem; and hour-setting means for step-by-step setting of solely the hour indicator means when the shaft is in the intermediate position, said hour-setting means comprising:

a stationary bridge; a slidable link; correcting gear pivotally carried by the link; a pinion in permanent mesh with the correcting gear; a slidable gear on said stem meshable with the pinion in the intermediate and the pulled-out positions of said stem; a toothed sector step drive gear means in selective mesh with the correcting gear for turning said toothed sector; means drivable by said toothed sector for driving, in the intermediate position of the stem, the hour indicator means through angular steps each corresponding to an angular extension of said toothed sector; and

pin-and-slot means interconnecting said slidable link with said bridge including means interconnecting said slidable link with said lever means, for maintaining the permanent mesh of said correcting gear with said pinion, and for controlling the selective mesh of said correcting gear with said step drive gear means to drive said hour indicator means through said toothed sector and correcting gear when said shaft and lever means are in their third positions.

3,866,409

CROWN ASSEMBLY

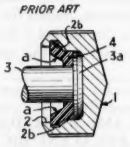
Kumiko Tanaka, Funabashi, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 27, 1973, Ser. No. 428,872

Claims priority, application Japan, Dec. 29, 1972, 47-477

Int. Cl. G04b *37/08*

U.S. Cl. 58—90 B **5 Claims**



1. A crown assembly for use in a watch, comprising a metallic crown which has a blind bore and a peripheral, undercut recess of the bore; a stem having an end portion in the bore; and annular lip means extending outwardly from said end portion into the recess for coupling the crown to the stem.

3,866,410

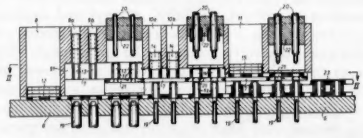
APPARATUS FOR ASSEMBLING ROLLER CHAIN ELEMENTS

Kurt Zwinge, Konberg, Germany, assignor to Firma Emil Linde, Wuppertal-Barmen, Germany

Filed Feb. 11, 1974, Ser. No. 441,727

Int. Cl. B21l *9/02*

U.S. Cl. 59—4 **4 Claims**



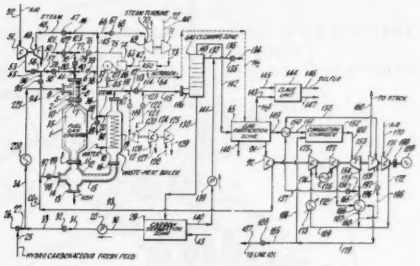
1. In an apparatus for assembling roller chain elements composed of bushings each having a longitudinal seam and a guide opening formed in the seam, rollers inserted over the bushings and side links and plates joining the bushings together to form chain blocks, the apparatus having a horizontal assembly line with a plurality of deposit ramps to receive the individual chain elements, vertical pressing members engaging the chain elements, grippers having chain receiving recesses for engaging and moving the bushings forward in a step-by-step movement, the improvement comprising:

frictional surface means disposed on the horizontal assembly line for engaging the bushings during the forward movement of the grippers so that the bushings rotate within the gripper recesses, and arresting means mounted in each gripper recess for engaging the bushing guide openings during the rotation of the bushings.

3,866,411
GAS TURBINE PROCESS UTILIZING PURIFIED FUEL AND RECIRCULATED FLUE GASES

Charles P. Marion, Mamaroneck, N.Y.; Warren G. Schlinger, Pasadena, Calif.; Albert Brent, Dix Hills, and James R. Muenger, Beacon, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1973, Ser. No. 428,980
Int. Cl. F02b *43/12*
U.S. Cl. 60—39.02 **28 Claims**



1. A process for the generation of power by means of a gas turbine having a combustion chamber and an expansion turbine comprising

1. reacting a hydrocarbonaceous fuel with a free-oxygen containing gas by partial oxidation in the presence of a temperature moderator in the reaction zone of a non-catalytic free-flow gas generator at an autogenous temperature in the range of about 1,500° to 3,500°F. and a pressure in the range of about 10 to 180 atmospheres absolute to produce an effluent gas stream comprising mixtures of H_2, CO, CO_2, and H_2O and one or more members of the group N_2, CH_4, COS, H_2S and Ar, and particulate carbon, and wherein the mole ratio (CO/H_2) dry basis of the effluent gas from the generator is at least 0.30;
2. cooling the effluent gas from (1) and introducing the cooled gas into a gas cleaning and purification zone and separately obtaining therefrom a stream of clean fuel gas comprising mixtures of H_2 and CO and one or more members of the group N_2, CH_4, CO_2 and H_2O; a CO_2-rich gas stream; a slurry stream comprising particulate carbon in a liquid vehicle; and a gas stream rich in H_2S and COS.
3. introducing into the combustion chamber of a gas turbine and burning therein the stream of clean fuel gas from (2) with a gaseous oxidizing stream produced subsequently in the process to produce a stream of clean flue gas; and
4. passing the stream of clean flue gas from (3) through an expansion turbine as the working fluid to develop power and to produce clean exhaust flue gas, and mixing at least a portion of said clean exhaust flue gas with air to produce the gaseous oxidizing stream in (3).

3,866,412
LIGHTWEIGHT, SMALL, COMBINED GAS AND STEAM MOTOR

Maurice Migneault, 69 Bowers St., Nashua, N.H. 03060

Filed Mar. 6, 1973, Ser. No. 338,543
Int. Cl. F02c *1/00*
U.S. Cl. 60—39.19 **16 Claims**

1. A lightweight, mobile combined gas and steam motor for vehicles, comprising:

a steam turbine and a gas jet turbine both included in a single housing, having a single vaned rotor fast on a power shaft, for driving said shaft;

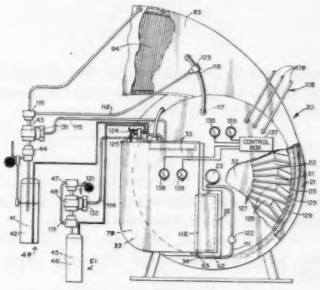
said single rotor having steam turbine vanes on one side to form a steam turbine chamber and having gas jet vanes on the other side to form a gas jet turbine chamber in said single housing;

a combustion chamber having ignition means therein and having boiler means therein;

fuel supply means and air supply means, each including a pressure tank supplying start-up pressure, said means connected to said combustion chamber for producing hot combustion gases therein while heating said boiler means to produce steam;

first conduit means connecting said boiler means to said steam turbine, said means including valved jet orifices for directing steam onto the said steam turbine vanes of said rotor;

second conduit means connecting said combustion chamber to said combustion gas jet turbine, said means including



a valved slot orifice for directing a jet of said combustion gas against the gas jet turbine vanes of said rotor;

third conduit means connecting said boiler means to said combustion gas jet turbine, said means including valved jet orifices within said combustion gas pressure chamber for directing steam against the gas jet turbine vanes of said rotor; and

valve control means for initially opening only said valved gas slot orifice, while steam builds up, then opening said valved steam jet orifice to drive, at a predetermined head of steam, said steam rotor vanes, and then opening said valved jet orifices of said third conduit means to drive said gas rotor vanes while reducing the generation of said combustion gas while said predetermined head of steam is maintained.

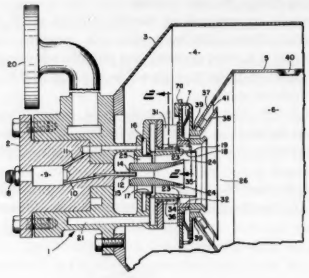
3,866,413
AIR BLAST FUEL ATOMIZER

Geoffrey J. Sturgess, Chardon, Ohio, assignor to Parker-Hannifin Corp., Cleveland, Ohio

Filed Jan. 22, 1973, Ser. No. 325,243
Int. Cl. F02c *7/22;* **B05b** *7/10*
U.S. Cl. 60—39.74 R **4 Claims**

3. A fuel nozzle for a gas turbine engine comprising a housing having passages therein adapted for communication with fuel and air pressure sources; primary and secondary atomizing means in said housing to supply combustible fuel-air mixtures to said engine; said secondary atomizing means comprising a prefilming tube around said primary atomizing means and defining therewith and with said housing annular air passages which at their upstream ends are communicated with said air pressure source, said prefilming tube at its upstream end communicating with said fuel passage for flow of fuel in film form around the interior of said prefilming tube to the downstream end thereof from which it is discharged with a radially outward velocity component into the annular air stream around said prefilming tube; said housing having an additional passage with metering orifices upstream of the downstream end of said prefilming tube to introduce high

velocity discrete jets of boost air, or oxygen, or gaseous fuel into and through the annular air stream which surrounds said



prefilming tube to impinge on the film of fuel as the latter emerges with a radial outward velocity component from the downstream end of said prefilming tube.

3,866,414

ION ENGINE

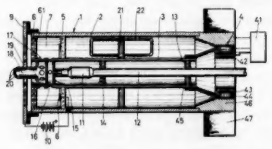
Alfred Bahr, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Apr. 18, 1973, Ser. No. 352,176

Claims priority, application Germany, Apr. 21, 1972, 2219545

Int. Cl. F03h *1/00;* **H05h** *1/18*

U.S. Cl. 60—202 **7 Claims**



1. In an ion engine with means defining a fuel conveying system and means defining a gas discharge chamber into which fuel enters in a gaseous form, means defining a high frequency resonator, said gas discharge chamber being part of said high-frequency resonator for effecting ionization of the gaseous fuel, means defining an accelerating electrode system at one end of said gas discharge chamber for extracting ionized gaseous fuel from said gas discharge chamber and accelerating same thus creating an accelerated ion beam and means for neutralizing the accelerated ion beam, the improvement comprising said accelerating electrode being arranged adjacent to said open end of said high-frequency resonator, said high-frequency resonator producing a standing wave having a node in the center of said high-frequency resonator and an oscillation loop at said open end.

3,866,415

FAN BLADE ACTUATOR USING PRESSURIZED AIR

John J. Ciokajlo, Loveland, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 25, 1974, Ser. No. 445,439

Int. Cl. F02k *3/02;* **F01d** *7/00;* **F03b** *3/14*

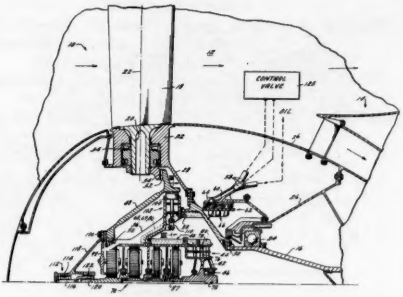
U.S. Cl. 60—226 R **11 Claims**

1. In a fan of the type used in a gas turbine engine having a core engine driving the fan through a fan shaft;

a. a plurality of variable pitch fan blades secured to said fan shaft for rotation;

b. a pitch change turbine mounted to said fan shaft for rotation relative thereto;

c. an actuation gear mounted to said fan shaft for rotation relative thereto wherein said actuation gear cooperates with said variable pitch blades to vary the pitch of said blades in response to rotation of said actuation gear relative to said fan shaft;



d. reduction gear means cooperating with said turbine and said actuation gear to rotate said actuation gear relative to said fan shaft in response to rotation of said turbine relative to said fan shaft;

e. pneumatic means for introducing air under pressure to said turbine to serve as the motive fluid of said turbine; and

f. control means to selectively regulate the flow of motive fluid to said turbine.

3,866,416

FUEL CONTROL APPARATUS FOR GAS TURBINE ENGINE

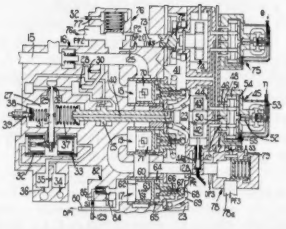
Geoffrey Arthur Lewis, Solihull, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Apr. 6, 1973, Ser. No. 348,635

Claims priority, application Great Britain, June 21, 1972, 29001/72

Int. Cl. F02c *9/06, 9/08*

U.S. Cl. 60—243 **22 Claims**



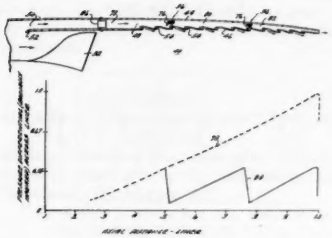
1. A fuel control apparatus for a gas turbine engine reheat system having a plurality of reheat burners, comprising a pump, a first control means means for imparting first and second motions to said first control means in response to variations in an engine temperature and an engine compressor pressure respectively, said first control means comprises a compound cam having a plurality of profiles which correspond to functions of said engine temperature for a plurality of values of said compressor pressure, a first variable metering orifice including a control member responsive only to said first and second motions of said first control means to regulate fuel

flow from said pump to a first reheat burner, a second control means positioned in response to the setting of an engine power demand device, and second and third variable metering orifices each including a control member responsive to said first and second motions of said first control means and to the position of said second control means, said second and third orifices regulating, in use, fuel flow from said pump to said second and third reheat burners respectively.

3,866,417
GAS TURBINE ENGINE AUGMENTER LINER COOLANT FLOW CONTROL SYSTEM

David A. Velegol, Colliers, W. Va., assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 9, 1973, Ser. No. 331,078
Int. Cl. F02c *7/20*; **F03k** *3/10*
U.S. Cl. 60—261 **8 Claims**



1. In a gas turbine engine of the type including a compressor, a turbine, a combustion system, an augmenter, an exhaust duct surrounding said augmenter, and a cooling liner positioned within said duct so as to form a cooling plenum therebetween, at least a portion of which liner extends downstream from said augmenter and is adapted to protect said exhaust duct from the high temperature gas generated by said augmenter, the improvement comprising:

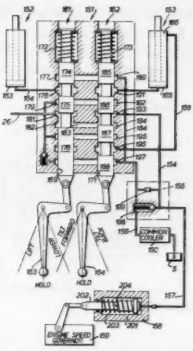
flange means situated within said cooling plenum and dividing said cooling plenum into at least two individual chambers, said flange means occupying a predetermined radial space in said cooling plenum and providing a restricted inlet between said chambers such that the average pressure differentials across the liner in each of said chambers are substantially equal.

3,866,418
HYDRAULIC APPARATUS

John Henry Waters, Cheltenham, England, assignor to Dowty Hydraulic Units Limited, Cheltenham, England

Filed Dec. 3, 1973, Ser. No. 420,862
Int. Cl. F16h *39/46*
U.S. Cl. 60—420 **13 Claims**

1. A power comprising assembly comprsing a positive-displacement pump, a variable speed power source adapted to drive the pump, a positive-displacement motor fed with hydraulic liquid delivered by the pump, a variable by-pass to cause some of the hydraulic liquid delivered by the pump to by-pass the motor in order to vary the motor speed, and means for controlling the speed of the power source, said means being responsive to the by-pass flow and so arranged that a

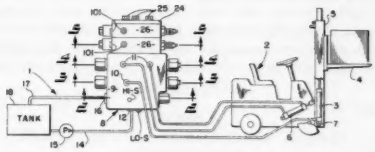


reduction in the by-pass flow will cause an increase in the speed of the power source and vice versa.

3,866,419
INTEGRATED PRESSURE COMPENSATED LOAD SENSING SYSTEM

John C. Paul, Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sept. 6, 1973, Ser. No. 394,560
Int. Cl. F15b *11/16*
U.S. Cl. 60—427 **81 Claims**



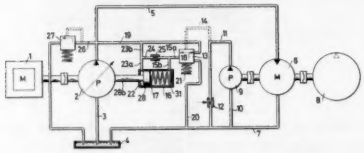
1. An integrated pressure compensated load sensing system comprising pump means; at least two fluid motors; a directional control valve having inlet, motor, and return ports respectively in fluid communication with said pump means, said fluid motors, and a tank; valve members movable in said directional control valve to control actuation of the respective motors and to define variable area orifices in the flow path of pressure fluid to the respective motors of sizes according to the extent of movement of the respective valve members; sensing means responsive to the pressure drops across said variable area orifices operative in conjunction with said pump means to maintain predetermined pressure drops across said orifices thus to actuate said fluid motors at desired speeds according to the sizes of said variable area orifices; check valves downstream of the respective orifices to render said sensing means responsive to the flow demand set by the valve member associated with the fluid motor of higher load pressure in the event of simultaneous actuation of said valve members; and pressure compensating members associated with the respective valve members; each pressure compensating member, when associated with the fluid motor of lower load pressure, sensing the flow demand of the variable area orifice set by the associated valve member and being moved to provide an additional restriction in one of the supply and return paths of fluid in said directional control valve thus to maintain the flow demand set by the variable area orifice of the valve

member associated with the fluid motor of lower load pressure.

3,866,420
HYDRAULIC DRIVE ARRANGEMENT

Wilhelm Appel, Donanstetten, Germany, assignor to G. L. Rexroth GmbH, Lohr/Main, Germany

Filed July 23, 1973, Ser. No. 382,095
Claims priority, application Germany, July 22, 1972, 2236134
Int. Cl. F16h *39/46*
U.S. Cl. 60—445 **5 Claims**

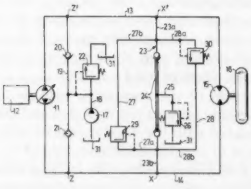


1. In an arrangement of the character described, a combination comprising a variable-output hydraulic pump; a hydraulic motor; a reservoir for hydraulic fluid; first conduit means connecting said pump with said reservoir and said motor; varying means for varying the output of said pump, comprising a cylinder, and a differential piston in said cylinder and dividing the interior thereof into two axially spaced chambers; second conduit means connecting one of said chambers with said first conduit means; third conduit means connecting said motor with said reservoir; fourth conduit means connecting said first conduit means in the region downstream of said motor with said reservoir; fifth conduit means connecting said fourth conduit means with the other of said chambers and communicating with said reservoir; variable valve means in said fifth conduit means; and throttling means communicating with said reservoir and with said variable valve means, said valve means being controlled by pressure which develops at said throttling means and varying the extent to which said other chamber can communicate with said reservoir.

3,866,421
FLUIDIC CIRCUIT FOR A HYDROSTATIC TRANSMISSION

Gunter Kersten; Hans-Jurgen Fricke, both of Stuttgart, and Karl Veil, Uhingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 13, 1973, Ser. No. 397,100
Claims priority, application Germany, Sept. 22, 1972, 2246638
Int. Cl. F16b *21/04*
U.S. Cl. 60—456 **8 Claims**

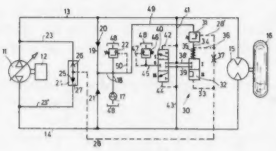


1. In a hydrostatic transmission including a main pump, a hydraulic motor, a high pressure conduit means and a low pressure conduit means, in combination, a fluidic circuit comprising priming pump means having an outlet means connected with a first point of said low pressure conduit means; at least one pressure limiting valve having an inlet conduit connected with said high pressure conduit means and an outlet conduit connected with a second point of said low pressure conduit means located between said hydraulic motor and said first point; and a flushing control valve means connecting said inlet conduit and outlet conduit and having discharge means for discharging into a low pressure area so that when increased pressure in said high pressure conduit means opens said pressure limiting valve, and fluid heated in said pressure limiting valve flows into said outlet conduit, a first part of said heated fluid flows through said flushing control valve means and said discharge means into the low pressure area, and a second part of said heated fluid flows at said second point into said low pressure conduit means to mix with cool fluid discharged from said priming pump means at said first point.

3,866,422
HYDRAULIC DRIVE

Gunter Kersten, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 9, 1974, Ser. No. 431,963
Claims priority, application Germany, Jan. 13, 1973, 2301612
Int. Cl. F15b *21/04*
U.S. Cl. 60—456 **7 Claims**



1. A hydraulic drive comprising a first hydraulic unit and a second hydraulic unit, one of said units being operated as pump and the other as hydraulic motor; a pair of main conduits connecting said units in a closed circuit, one of said main conduits being a high-pressure conduit and the other a low-pressure conduit; overpressure means including a flushing valve and pressure limiting valve means connected to said circuit so as to be operated with the pressure in said high-pressure conduit exceeds a predetermined pressure to establish a first connection between said high-pressure and said low-pressure conduit and over said flushing valve a second connection between said high-pressure conduit and a container; and a feed pump for feeding fluid from said container into said low pressure conduit.

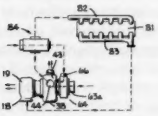
3,866,423
TURBOCHARGER COMPRESSOR WITH DUAL INLET AND COLLECTOR CHAMBERS

Edward F. Benisek, Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Division of Ser. No. 263,009, June 15, 1972. This application May 24, 1973, Ser. No. 363,356
Int. Cl. F02b *29/04*
U.S. Cl. 60—599 **2 Claims**

1. In combination, an internal combustion engine, a turbocharger having a compressor component for delivering an air charge to the air induction system of the engine, a heat exchanger having at least two flow paths therethrough in heat exchange relation with each other, said compressor component having discrete dual air intake and discharge passages, and means connecting one flow path of said heat exchanger to atmosphere and to one of said intake passages of said compressor component, connecting the corresponding discharge

passage of said compressor to atmosphere, connecting the other of said compressor component intake passages to atmosphere and the corresponding compressor component discharge passage through said other flow path of the heat exchanger to the air induction system of said engine, whereby said turbocharger compressor component draws ambient cooling air through said heat exchanger and forces charge air through said heat exchanger to lower the temperature of the



charge air delivered to the air induction system of the engine, said disrete, dual air intake pasaages of said compressor component substantially separating the intake air coming from said heat exchanger outlet from the intake from atmosphere, whereby the heated air exiting from the heat exchanger does not substantially mix with the ambient air entering the compressor to raise the temperature of the ambient air prior to its being compressed.

3,866,424

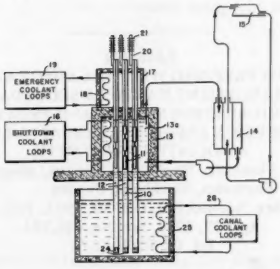
HEAT SOURCE CONTAINING RADIOACTIVE NUCLEAR WASTE

Harold M. Busey, Bethesda, Md., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 3, 1974, Ser. No. 466,770

Int. Cl. F03g *7/06*; **F01k** *27/00*

U.S. Cl. 60—644 **6 Claims**



1. A heat source comprising at least one sealed vertically disposed heater tube containing a boiling liquid pressurized by an inert noncondensable gas, at least one capsule containing solidified radioactive waste material suspended within each of said heater tubes and immersed in said boiling liquid, a heater box containing a primary coolant surrounding said heater tubes, the heater tubes extending above and below the heater box, means for extracting heat from said primary coolant, a backup coolant box containing emergency coolant surrounding said heater tubes immediately above said heater box and means for extracting heat from said emergency coolant, said heater tube being pressurized by the inert gas so that under normal operating conditions the interface zone between the inert gas and the vapors of the boiling liquid falls between the heater box and the backup coolant box.

3,866,425

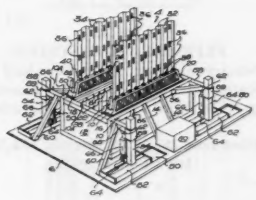
METHOD OF AND APPARATUS FOR THE DRIVING AND EXTRACTOR OF SHEET PILES

Anthony Ronald Seaton Morrice, Harrogage, England, assignor to Hudswell Morrice Ltd., Leeds, England

Filed Dec. 29, 1972, Ser. No. 319,419

Int. Cl. E02d *5/16, 7/00, 13/04*

U.S. Cl. 61—53.5 **8 Claims**



1. A method of inserting a pile comprising the steps of pitching one or more piles relative to a piling apparatus supported on a ground surface, driving said pitched pile into the ground, raising said piling apparatus clear of the ground so that the piling apparatus is supported on a plurality of movable bearing pads, moving the piling apparatus forwardly relative to the bearing pads, lowering said piling apparatus relative to the bearing pads so that the piling again rests on the ground, and excavating between the driven piles.

3,866,426

TUNNEL DRIVING APPARATUS

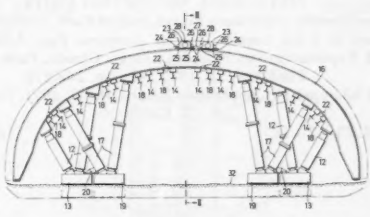
Armin Lobbe, Bergk-Oberaden, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar bei Lunen and Gewerkschaft Eisenhutte Westfalia, Westfalia, both of, Germany

Filed Oct. 11, 1973, Ser. No. 405,510

Claims priority, application Germany, Oct. 13, 1972, 2250296

Int. Cl. E01g *3/00*

U.S. Cl. 61—85 **12 Claims**



1. A tunnel driving apparatus comprising:

A. a plurality of roof support assemblies, each assembly having:

a. a front and a rear roof support member, each member extending across the tunnel;

b. longitudinally extending interconnecting members attached between the front and rear support members;

c. floor rails extending along the tunnel;

d. slidable ram props extending upwardly from the floor rails to the roof support members;

e. the front and rear roof support members of one roof support assembly being interspersed between the front and rear roof support members of another roof support assembly; and

f. means for effecting relative movement between the roof support assemblies in the direction of advancement of the tunnel;

B. a shield including a plurality of elongate elements extending along the tunnel and slidably carried by the roof support members;

C. means for guiding the elongate elements longitudinally on the roof support members; and

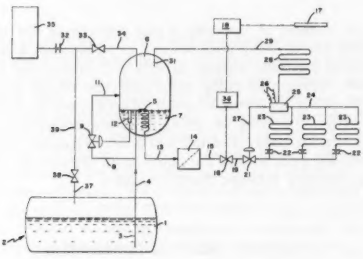
D. means for moving the elongate elements in the direction of advancement of the tunnel.

3,866,427

REFRIGERATION SYSTEM

Noel Y. Rothmayer, Madison; James Crawford B. MacKeand, Convent Station, and Clark W. Smith, Bloomingdale, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,701
Int. Cl. F25b *19/00*
U.S. Cl. 62—7 **14 Claims**



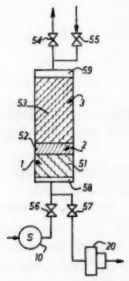
12. A method as claimed in claim **11** wherein the flow of refrigerant through the tubular evaporator is regulated, actuated by variation in temperature of said heat conductive element.

3,866,428

CRYOGENIC SEPARATION OF AN AIR FEED USING MULTI-ZONE ADSORPTION UNITS

Guy Simonet, and Claude Pivard, both of Paris, France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Apr. 28, 1972, Ser. No. 248,579
Claims priority, application France, May 3, 1971, 71.15807
Int. Cl. F25j *3/00*
U.S. Cl. 62—18 **10 Claims**



1. A method of fractionation by adsorption of air in order to obtain a gaseous fraction impoverished in at least a first constituent and a second constituent of said air, carried out with at least one adsorption line comprising in the direction of the adsorption cycle stream successively a first adsorption zone, a thermal accumulation zone, and a second adsorption zone, said zones being fixedly connected in series and continuously in communication with each other, and said first and second adsorption zones adsorbing respectively at least said first constituent and at least said second constituent of said air, said method comprising performing at least an adsorption cycle with a single said adsorption line operating in a substantially adiabatic manner, said adsorption cycle comprising:

a. an adsorption and production phase during which said air enters the inlet of the adsorption line, flows in said adsorption line in the adsorption direction from said first adsorption zone, into successively said thermal accumulation zone and said second adsorption zone, and at least said impoverished gaseous fraction is obtained at the outlet of said adsorption line; during said phase, in said thermal accumulation zone there is extracted from said air a quantity of heat liberated by the adsorption of said first constituent in said first adsorption zone, and then there is restored to said air a quantity of refrigeration liberated by the desorption of said second constituent in said second adsorption zone, during a desorption and regeneration phase, hereunder defined as phase *b*, of a previous cycle carried out with said adsorption line, whereby said air is cooled between said first and second adsorption zones,

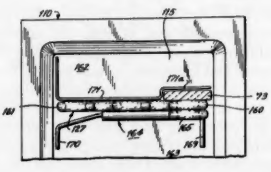
b. a desorption and regeneration phase during which at least said first and second constituent are desorbed, and a regeneration fraction flows in said adsorption line up to the inlet thereof, countercurrent to the adsorption direction, from said second adsorption zone into said thermal accumulation zone and said first adsorption zone, and at least another gaseous fraction enriched in at least said first constituent and said second constituent, is obtained at the inlet of said adsorption line; during phase *b*, in said thermal accumulation zone there is extracted from said regeneration fraction a quantity of refrigeration liberated by the desorption of said second constituent in said second adsorption zone, and then there is restored to said regeneration fraction, the quantity of heat extracted during the previous adsorption and production phase of the same cycle, hereabove defined as phase *a*, whereby said regeneration fraction is heated between said second and first adsorption zones.

3,866,429

METHOD OF FREEZING WITH THE AID OF A COOLING ARRANGEMENT HAVING A SECONDARY REFRIGERATION SYSTEM AND PRIMARY ABSORPTION REFRIGERATION APPARATUS ASSOCIATED THEREWITH

Peter Erik Blomberg, Stockholm, Sweden, assignor to Aktiebologet Electrolux, Stockholm, Sweden

Division of Ser. No. 405,153, Oct. 10, 1973. This application Apr. 17, 1974, Ser. No. 461,784
Int. Cl. F25b *15/10*
U.S. Cl. 62—65 **3 Claims**



1. In the art of freezing goods to be frozen and maintaining already frozen goods frozen with a primary refrigeration system employing an inert gas into which liquid refrigerant evap-

orates in a primary place of evaporation and a secondary refrigeration system having a heat transfer fluid which condenses in a place of condensation and evaporates in a place of evaporation, the liquid refrigerant evaporating into inert gas at a low temperature in a first part of said primary place of evaporation and at a higher temperature in a second part of said primary place of evaporation, the improvement which comprises

a. placing goods to be frozen in heat exchange relation with the second higher temperature part of said primary place of evaporation for the latter to abstract heat from such goods,

b. transferring heat to the first low temperature part of said primary place of evaporation from the place of condensation of said secondary refrigeration system to condense heat transfer fluid therein, and

c. placing already frozen goods in heat exchange relation with the place of evaporation of said secondary refrigeration system for evaporating heat transfer fluid therein by heat abstracted from such goods to maintain the latter frozen,

d. the temperature at which refrigerant evaporates into inert gas in the second higher temperature part of said primary place of evaporation decreasing as the goods to be frozen and in heat exchange relation with such higher temperature part approaches a freezing state and reduces the refrigerating load on the primary place of evaporation.

3,866,430

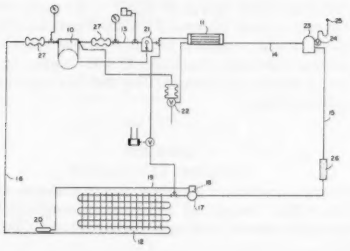
METHOD AND APPARATUS FOR CONTROLLING REFRIGERANT FLOW IN CRYOGENIC SYSTEMS

Robert C. Webber, 8634 Brookville Rd., Indianapolis, Ind. 46239

Continuation-in-part of Ser. No. 425,181, Dec. 17, 1973, abandoned. This application July 26, 1974, Ser. No. 492,158

Int. Cl. F25b *41/04*

U.S. Cl. 62—115 **10 Claims**



1. A method of controlling refrigerant flow in a cryogenic refrigeration circuit including a compressor, a condensor, an evaporator, conduit means connected to lead refrigerant from the compressor to the condensor, thence to the evaporator, and thence back to the compressor, and a charge of phase-change refrigerant in said circuit, which includes the steps of providing a pressure-responsive valve to control refrigerant flow through said conduit means, providing a thermo-responsive variable-pressure system operatively connected to actuate said valve, said system including a bulb arranged in heat-exchanging relation with a remote point in said conduit means, and charging said system with a limited vapor charge of a refrigerant having a boiling point significantly lower than the boiling point of the refrigerant in the said refrigeration circuit, the limited vapor charge being 20 to 40 psi at ambient temperature, and the quantity of said liquid vapor charge being such as to preclude liquefaction thereof at temperatures to be encountered by said system.

3,866,431

METHOD OF AND MEANS FOR FREEZING BY A COOLING ARRANGEMENT EMBODYING A SECONDARY REFRIGERATION SYSTEM AND PRIMARY ABSORPTION REFRIGERATION APPARATUS ASSOCIATED THEREWITH

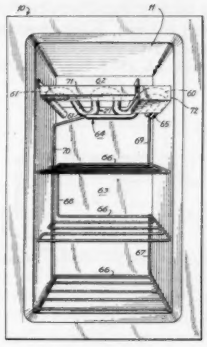
Peter Erik Blomberg, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Oct. 10, 1973, Ser. No. 405,153

Claims priority, application Sweden, Oct. 12, 1972, 13187/72

Int. Cl. F25b *15/10*

U.S. Cl. 62—183 **15 Claims**



2. A freezer as set forth in claim 1 comprising a cabinet having a thermally insulated interior, and means defining a space in the cabinet interior for storing already frozen goods, the evaporation portion of said secondary refrigeration system being in heat exchange relation with said space for abstracting heat from such already frozen goods.

3,866,432

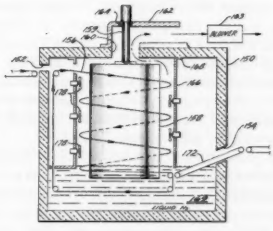
HELICAL CONVEYOR HEAT EXCHANGE SYSTEM

Donald I. Harrison, Santa Monica, Calif., assignor to Cryo-Chem, Inc., Gardena, Calif.

Filed Mar. 29, 1973, Ser. No. 345,990

Int. Cl. F25b *41/00*

U.S. Cl. 62—208 **10 Claims**



1. Cooling apparatus comprising a thermally insulated enclosure with an inlet and an outlet for material to be cooled, the inlet being below the outlet, a helical conveyor having upper and lower ends disposed in the enclosure about an upright axis to carry the material upwardly from the inlet to the outlet of the enclosure, an upright annular and imperforate baffle disposed within the helical convevyor, means for introducing liquid nitrogen into the enclosure to contact the material on the conveyor at a point nearer the enclosure outlet than the inlet so the liquid nitrogen absorbs sufficient heat to vaporize to nitrogen gas, fan means in the enclosure arranged to impart a horizontal velocity vector component to the nitro-

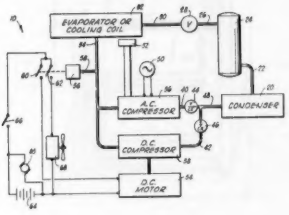
gen gas thus blowing it around the helical conveyor in the direction opposite to that in which the material is moved on the conveyor, means for creating a lower pressure at the lower end of the helical conveyor than at the upper end so that a vertical velocity vector component is imparted to the gas so that substantially all the nitrogen gas flows down the helical conveyor, the net flow of the gas being to spiral downwardly around the helix to effect countercurrent cooling of material with the nitrogen gas, and means for removing nitrogen gas from the enclosure.

3,866,433

AUXILIARY REFRIGERATION POWER MEANS

Lawrence M. Krug, Wichita, Kans., assignor to George C. Jeffreys, Goldsboro, N.C.

Filed Sept. 12, 1973, Ser. No. 396,387
Int. Cl. F25l
U.S. Cl. 62—229 **9 Claims**



1. In an engine powered vehicle having a storage battery and a generator connected to said engine and battery, and a refrigerated compartment and a refrigeration system therefor including a cooling coil, a compressor connected by a conduit to the outlet of said cooling coil, an alternating current motor operatively connected to said compressor, a condensor connected by conduit to the outlet of said compressor and to the inlet of said cooling coil, and an expansion valve or the like in the conduit to said cooling coil, the improvement therein and therewith, comprising:

a. a second compressor mounted on said vehicle, said second compressor connected to said condensor and said cooling coil in parallel with said first named compressor,

b. a direct electric motor mounted on said vehicle and operatively connected to said second compressor, said direct current motor being electrically connected to said storage battery and said generator in powered relation thereto, and

c. control means operatively connected to said system downstream of said second compressor and to said direct current motor to intermittently operate said direct current motor and second compressor relative the refrigeration demand of said system,

said second compressor is constructed and adapted to be operable during periods when said alternating current motor is disconnected from a source of alternating current electicity.

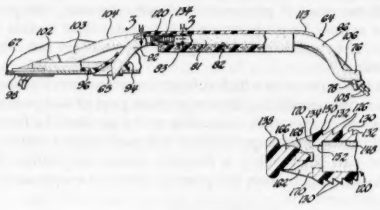
3,866,434

MENISCUS CONTROL INSERT FOR AUTOMATIC ICE MAKER WATER FILL TUBE

Cecil C. Pugh, Dayton, and Ronald L. Ringer, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1973, Ser. No. 416,189
Int. Cl. F25c *1/04*
U.S. Cl. 62—340 **3 Claims**

1. A supply conduit extending through a wall of a refrigerator cabinet for supplying liquid to a freezing mold of an automatic ice maker, said conduit including an intermediate linear cylindrical portion formed with an inlet end and a downwardly curved outlet end; said conduit intermediate portion having an insert positioned therein to receive all the liquid from said inlet end, said insert comprising an elongate cylindrical stem portion on its upstream end having a central longitudinal axis and an integral frusto-conical shaped nose portion on its downstream end with the nose portion large base coincident with the downstream end of said stem portion, rib means on the outer surface of said stem portion for sealingly engaging the inner surface of said linear portion, said nose portion having an obstruction disk integrally formed on its downstream small base end concentric with said stem portion, said insert stem portion having a central water inlet passage extending therethrough to a point adjacent the downstream end of said stem portion, said central passage connecting with a reduced axial bore extending a predetermined distance into said nose portion, a diverter cone at the downstream end of



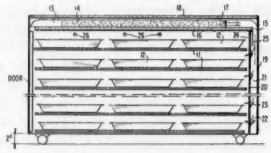
said bore with its nose pointed in an upstream direction such that said cone is aligned on said central longitudinal axis, said frusto-conical nose portion having a plurality of elongated restricted exit orifices circumferentially spaced therearound defining a plurality of radial ribs therebetween, whereby liquid entering said axial bore is radially diverted by said diverter cone through said restricted exit orifices, the exiting liquid upon contacting said obstruction disk creating a turbulent reduced velocity flow of the liquid prior to exiting from said conduit outlet portion, and whereby upon said conduit supplying a predetermined charge of liquid to the mold the flow of liquid in said conduit is stopped and the meniscus of the liquid remaining in said conduit is retained at said insert restricted exit orifices obviating blockage of said supply conduit by preventing water drops from exiting and freezing at said conduit outlet portion.

3,866,435

COOLING CONTAINER

Karl Frank, Linz/Rhine; Martin A. Frank, Cologne, and Dieter Tschentscher, Mayen, all of Germany, assignors to Firma Burger Eisenwerke Aktiengesellschaft, Burg/Dillkreis, Germany

Filed June 4, 1973, Ser. No. 366,279
Claims priority, application Germany, June 5, 1972, 2227313
Int. Cl. F25d *25/02*
U.S. Cl. 62—382 **17 Claims**



1. In a transportable cooling container adapted to keep temperature-sensitive products, such as food and pharmaceuticals, cool during transportation thereof and having

a work space subdivided into several vertically spaced prod-

uct compartments for the cooled products including an uppermost product compartment

a coolant compartment disposed above said product compartments, there being a tendency during transportation of said container for the compartments to become progressively warmer relative to a downward direction of reference;

the improvement comprising:

at least one passage means descending from the coolant compartment and adapted to receive a gravity flow of gasified coolant; and

a plurality of vertically spaced apertures branching from the descending passage means and individually communicating with individual ones of said product compartments;

the sizes of the inlet mouths of said apertures increase progressively relative to a downward direction of reference such that said apertures divide said gravity flow of gasified coolant into increasingly larger portions relative to a downward direction of reference, to maintain the temperatures of said product compartments substantially uniform.

3,866,436

COOLING CONTAINER

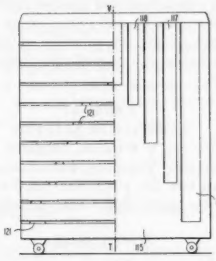
Karl Frank, Linz/Rhine, and Martin A. Frank, Cologne, both of Germany, assignors to Firma Burger Eisenwerke Aktiengesellschaft, Burg/Dillkreis, Germany

Filed June 4, 1973, Ser. No. 366,280

Claims priority, application Germany, Aug. 7, 1972, 2238829

Int. Cl. F25d *25/02*

U.S. Cl. 62—382 **9 Claims**



1. In a transportable cooling container for keeping temperature-sensitive products cool and having

a work space for chilled products having a plurality of vertically displaced product compartments, and

a coolant compartment above said work space operable to contain a gasifiable coolant,

the improvement in said container comprising:

a pair of side walls operable to extend longitudinally of a direction of transportation and transversely of an axis of tilting of said container likely to occur during said transportation; and

a plurality of descending passages located along each of said longitudinally extending side walls, communicating with said coolant compartment and operable to receive a gravity flow of gasified coolant therefrom, and further communicating with diverse ones of said product compartments;

said descending passages being dimensioned such that the flow capacity of the descending passages of each side increases progressively so as to conduct to said product compartments a progressively greater flow of cooling gas relative to a downward direction of reference in a manner maintaining the temperatures of said product compartments substantially uniform.

3,866,437

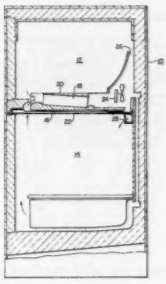
ADJUSTABLE DAMPER CONTROL MECHANISM

Donald J. Spencer, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1973, Ser. No. 395,805

Int. Cl. F25d *17/04*

U.S. Cl. 62—408 **8 Claims**



1. An adjustable damper control mechanism for a refrigerator/freezer having two compartments separated by a divider wall, said damper control mechanism providing means to set the position of a damper movable between open and closed positions with respect to an air duct to regulate the relative air flow to said two compartments, said mechanism including:

a manually settable control knob mounted generally remote from said damper; and

linkage means connecting said damper to said knob so as to correlate the position of said damper to be as indicated by said knob, said linkage means being generally disposed within said divider wall and including:

a rotatable lever member attached to said damper; and

a movable pivot plate for pivotally engaging said lever member, said movable pivot plate having a portion extending exteriorly of said divider wall and being manually accessible to adjust the final position of said pivot plate with respect to said damper so that the position of said damper as determined by said linkage means can be adjusted to correspond to the position indicated on said control knob.

3,866,438

MOTOR COOLING APPARATUS UTILIZING A REFRIGERANT FLOW CIRCUIT

James W. Endress, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,666

Int. Cl. F25b *43/02*

U.S. Cl. 62—468 **1 Claim**

1. Apparatus for cooling an electric motor of the type having a casing, a stator and rotor arranged within the casing, and bearing and seal means supporting the rotor, including:

sump means within the casing adapted to hold a supply of liquid refrigerant and lubricant,

first conduit means extending from the sump to the portions of the motor requiring cooling and lubrication,

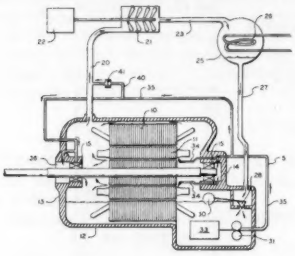
pump means within the sump to pump liquid refrigerant and lubricant through the first conduit means,

second conduit means extending from the casing to the sump,

a condenser positioned in the second conduit means to condense vaporized refrigerant for return to the sump,

a compressor positioned in the second conduit means ahead of the condenser to draw gaseous refrigerant with entrained lubricant from the casing and compress the refrig-

erant and to move the refrigerant through the conduit to the condenser, and



means communicating with the first conduit means so as to be subject to pressure developed by the sump to provide liquid refrigerant and lubricant from the sump into the second conduit ahead of the compressor to provide lubrication for the compressor.

3,866,439

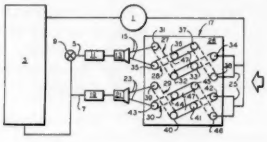
EVAPORATOR WITH INTERTWINED CIRCUITS

Rudy C. Bussjager, Minoa, and William W. Bell, Jr., Marcellus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,879

Int. Cl. F25b *39/02*

U.S. Cl. 62—504 **5 Claims**



1. A compression refrigeration system including condenser means, a plurality of parallel refrigerant lines for conveying condensed refrigerant from said condenser means, refrigerant distribution means in each of said parallel refrigerant lines, closing means for selectively closing at least one of said parallel refrigerant lines to refrigerant flow, and an evaporator including a plurality of parallel heat exchange fins and a plurality of intertwined refrigerant circuits running through the evaporator generally transverse to said heat exchange fins, groups of said circuits covering contiguous areas of said evaporator transverse to the direction of flow of external heat exchange medium moving over said evaporator, and said groups of circuits being connected to different ones of said refrigerant distribution means, the group of circuits connected to the distribution means in the refrigerant line including said closing means being removable from service in response to the closing of said closing means to substantially reduce heat exchange between the external heat exchange medium passing through the area covered by said latter group of circuits and the evaporator.

3,866,440

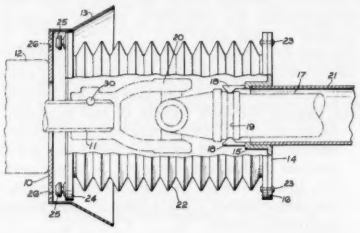
SAFETY GUARDS

Leonard William Stananought, Whalley, England, assignor to Atkinson's of Clitheroe Ltd., Clitheroe, England

Filed Aug. 6, 1973, Ser. No. 385,722

Int. Cl. F16d *3/19*

U.S. Cl. 64—18 **6 Claims**



1. A safety guard for a universally jointed connection between main and intermediate shafts of a power take-off assembly including first locating means adapted to be operatively mounted around the main shaft while permitting rotation of the latter relative to said means, second locating means having a bearing formation adapted to be operatively mounted upon the intermediate shaft for angular movement therewith relative to the main shaft while permitting rotation of the latter relative to said second means, and an angularly flexible and axially contractible bellows member forming a continuous enclosure joining said first and second locating means to form a continuous enclosure in operative spaced surrounding relationship to said connection said bellows member being releasably connected to one of said means so as to be capable of being contracted axially on selective release therefrom to permit access to at least a part of said connection.

3,866,441

COMPOSITE SLIDERS

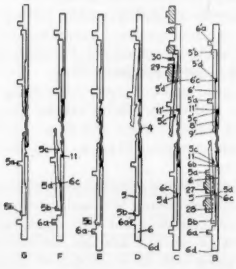
Roland Peberdy, South Wigston, England, assignor to The Bentley Engineering Company, Ltd., Leicester, England

Filed Feb. 20, 1973, Ser. No. 333,457

Claims priority, application Great Britain, Feb. 19, 1972, 7797/72

Int. Cl. D04b

U.S. Cl. 66—14 **17 Claims**



1. In a knitting machine having coaxial needle cylinders with aligned tricks, needles slidable in said tricks and transferable from one cylinder to another, said needles having hooks at opposite ends, sliders slidable in said tricks and engageable with the needles to actuate and control the needles, and means for actuating the sliders, the improvement that each of said sliders is a composite slider comprising:

an elongate first body portion slidable lengthwise in a trick and having at one end an end face for abutting the outside on the hook of a needle in the trick,

an elongate second body portion slidable lengthwise in the same trick relative to the first body portion and having at one end a hook inclined towards said end face for abutting with the inside of the needle hook, said first and second body portions fitting together in the trick to form an elongate composite slider,

a first butt on said first body portion adjacent the other end thereof projecting outwardly of the first and second body portions for engagement by slider actuating means to control lengthwise movement of said first body portion in the trick,

a second butt on said second body portion projecting outwardly of the first and second body portions for engagement by slider actuating means separately to control lengthwise movement of said second body portion in the trick, and abutment means for preventing the first and second butts moving together and maintaining them in longitudinally spaced relationship,

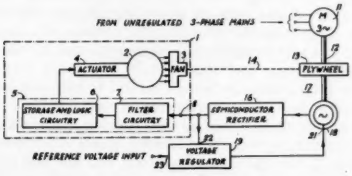
said first and second body portions being movable lengthwise relative to one another by actuation of the first and second butts between a first position in which a needle hook is held firmly between said end face of the first body portion engaging the outside of the needle hook and said hook of the second body portion engaging the inside of said needle hook, and a second position in which the hook of the second body portion is separated lengthwise from said end face of the first body portion to enable the composite slider to engage or disengage the needle hook.

3,866,442

D.C. EXITATION ARRANGEMENT FOR A TEXTILE MACHINE PROGRAMMER

Oldrich Kouril, and Jaroslav Knourek, both of Brno, Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Jan. 12, 1972, Ser. No. 217,185
Int. Cl. D04b *15/78, 15/38*
U.S. Cl. 66—50 R **2 Claims**



1. In a textile machine of the type in which a programmer issues commands to selected actuators associated with one or more systems of the machine in timed relation to the operation of the machine to control the pattern of the fabric to be manufactured, in which the machine further includes exhaust means for removing filamentary imperfections from the manufactured fabric by means of suction and a DC excitation arrangement including generating means driven by an AC motor coupled to an unregulated 3-phase AC source and having a stabilizing flywheel on its shaft, and in which the programmer includes first filter circuitry that is accessible via a first DC power input thereof and is excited by the output of the DC excitation arrangement:

means for coupling the flywheel to the exhaust means for driving the latter when the AC motor is operated;

a single phase Ac generator coupled to the shaft for producing a substantially constant output voltage;

a first semiconductor rectifier coupled to the output of the AC generator; and

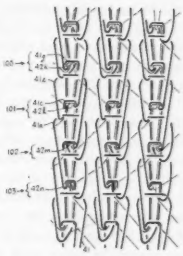
means for coupling the output of the first rectifier to the first DC input of the programmer.

3,866,443

TERRY CLOTH

Fred E. Hunneke, Tenafly, and Martin Traumuller, Dumont, both of N.J., assignors to Domestic Fabrics Corporation, Englewood, N.J.

Continuation-in-part of Ser. No. 846,755, Aug. 1, 1969, abandoned. This application Sept. 15, 1971, Ser. No. 180,930
Int. Cl. D04b *7/12, 9/12, 11/08*
U.S. Cl. 66—194 **4 Claims**



1. A terry cloth formed on a double needle bar Raschel warp knitting machine comprising, in combination:

a. a system of threads forming a ground structure knitted upon one said needle bar;

b. a system of terry threads being knit into the ground structure at predetermined points;

c. said system of terry threads being chain stitches knit into the ground structure under very little tension;

d. said system of terry threads being disposed in preselected areas upon one side of said system of threads forming said ground structure;

e. said system of threads forming said ground structure being tighter knit than said system of terry threads;

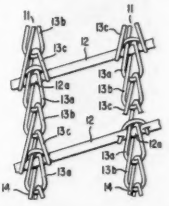
f. said system of terry threads being interconnected upon said one side of said system of threads forming said ground structure whereby said system of terry threads are interconnected on the terry surface of said terry cloth.

3,866,444

KNITTED OPENWORK ELASTIC MESH FABRIC

Nathan Levin, 416 Highgate Dr., Trenton, N.J. 08618

Continuation of Ser. No. 279,520, Aug. 10, 1973, abandoned. This application Apr. 5, 1974, Ser. No. 458,201
Int. Cl. D04b *21/100*
U.S. Cl. 66—195 **1 Claim**



1. Seamless tubular knitted openwork mesh fabric of indefinite length comprising a circular series of individual lengthwise extending warp strings arranged in circumferentially spaced parallel array interknitted at equally spaced points along the lengths thereof with spaced convolutions of a single weftwise extending helically arranged strand of elastic yarn, such arrangement providing the fabric with quadrangular-shaped mesh openings, each of said warp strings consisting solely of successive groups of a like plurality of crochet knitted chain stitches formed of non-elastic yarn and of single

stitches formed solely of said elastic yarn disposed between and interknit with said successive groups of chain stitches whereby each said warp string is formed solely of longitudinally spaced single stitches of said elastic yarn arranged in alternating relation with respect to said successive groups of chain stitches, each stitch of the elastic yarn having been drawn through the last-formed stitch of a group of said chain stitches and the first-formed stitch of each group of said chain stitches having been drawn through a stitch of the elastic yarn, said stitches of elastic yarn being in unknit formation wherein the yarn thereof extends in linear condition in said helical arrangement of said elastic yarn when said fabric is in relaxed condition, such linear condition of said unknit stitches being due solely to the inherent characteristic of said elastic yarn itself, said nonelastic yarn floating lengthwise in non-knitted condition across said unknit elastic yarn stitches and between said last and said first formed stitches of immediately adjoining groups of said non-elastic yarn chain stitches, said elastic yarn comprising a lengthwise extending elastic core covered with transversely extending windings of yarn, only said last and said first-formed chain stitches of immediately successive groups thereof commonly embracing the unknit stitches of elastic yarn disposed therebetween in such manner that force exerted in lengthwise direction upon said fabric is exerted directly upon said groups of warp chains and causes only said last and said first-formed chain stitches of said groups thereof to correspondingly exert force in opposite directions upon said unknit stitches of elastic yarn therebetween thereby to urge the return of the same to knit loop conformation whereby said non-elastic yarn of said last and of said first-formed chain stitches of immediately successive groups thereof are caused to interengage with said windings of the elastic yarn in said unknit stitches thereof thereby to inhibit displacement of said warp strings transversely of said fabric and to maintain intact the integrity of said mesh openings therein the said fabric being formed solely of said elastic and of said non-elastic yarns arranged in the manner set forth.

3,866,445

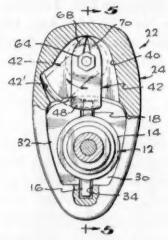
AUTO IGNITION LOCK

Warren L. Erwin, 9906 Douney Ave., Downey, Calif. 90240

Filed July 19, 1973, Ser. No. 380,884

Int. Cl. E05b *17/14*

U.S. Cl. 70—428 **12 Claims**



1. An auxiliary lock for providing controlled access to an auto ignition lock comprising:

housing means having an aperture configured to matingly receive an auto ignition lock, the housing being adapted to be disposed over and to prevent access to the ignition lock; and

means mounted on the housing means and movable between a first position within the aperture in engagement with the ignition lock to prevent removal of the housing means from the ignition lock and a second position out of engagement with the ignition lock and permitting removal of the housing means from the ignition lock.

3,866,446

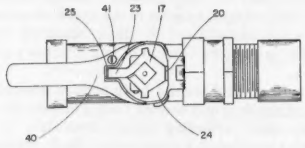
LOCKING HANDLE COCK

Luther H. Lemley, Lafayette, Ind., assignor to Willem Corporation, Rushville, Ind.

Filed Oct. 26, 1972, Ser. No. 301,164

Int. Cl. F16k *35/00*

U.S. Cl. 70—176 **2 Claims**



1. In a valve used in a pneumatic line extending between adjacent railroad cars, said valve having a tubular main body with an inlet, an outlet and a passage extending therebetween, said valve also having a blocking member pivotally mounted to said main body and extending across said passage, said valve further having handle means mounted to said blocking member, said means being operable to pivot said blocking member to and from a first position wherein fluid flow through said passage is allowed and to and from a second position wherein fluid flow through said passage is blocked by said blocking member, said main body having a ledge with a first stop surface and a projection with a second stop surface, said handle means having a handle pivotally mounted to said member being pivotable to and from a downward position and an upward position, said handle having a first depending ear and said member having a second depending ear, said first and second ear positioned adjacent and between respectively said second stop surface and said first stop surface when said handle is in said downward position and said member is in said first position preventing movement of said member from said first position to said second position, said handle includes a flat top wall having a slot extending therethrough with said second ear of said member extending through said slot, said handle being movable to said upward position whereupon said handle and said member may be then pivoted to said second position wherein the improvement comprises lock means mounted to said handle being operable to lock said handle to said ledge preventing movement of said handle from said downward position to said upward position when said member is in said first position, said locking means is a cylinder lock mounted to said flat top wall adjacent said slot with said cylinder lock having a movable cam wall movable beneath said ledge.

3,866,447

APPARATUS AND METHOD FOR STRAIGHTENING TUBES

William Kerr Ritchie, Woodbridge, England, assignor to The Post Office, London, England

Filed May 14, 1973, Ser. No. 359,897

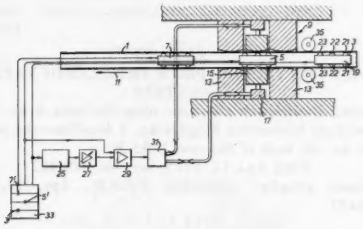
Claims priority, application Great Britain, May 18, 1972, 23372/72

Int. Cl. B21d *3/10*

U.S. Cl. 72—9 **16 Claims**

1. Apparatus for straightening a tube, including first and second measuring devices locatable within the bore of the tube and operable to generate, respectively, a control signal and a feed back signal, each of said signals being representative of the deviation from straightness in the surrounding portion of the tube; a tube straightening mechanism connected to receive the control and feedback signals and operable to apply, to that portion of the tube in which the second measuring device is located, a straightening force dependent

on the relative values of the control and feedback signals derived from that portion; and a mechanism operable to effect



relative movement between the tube and both the measuring devices and straightening mechanism.

3,866,448

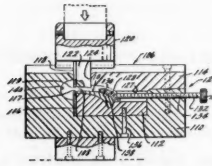
APPARATUS FOR CONSTRUCTING AIR COOLED TURBOMACHINERY BLADING

Ronald E. Dennis, Cincinnati, and William D. Treece, Forest Park, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 320,522, Jan. 2, 1973,. This application Apr. 12, 1974, Ser. No. 460,535

Int. Cl. B30b *15/22*

U.S. Cl. 72—30 **3 Claims**



1. Apparatus for forming the trailing edge portion of a turbomachinery blade, which includes an airfoil having a leading edge portion, concave and convex side walls extending from said leading edge portion and forming at least one internal cavity within said airfoil, and a trailing edge portion comprising a first wall extending from said concave side wall and a second wall extending from said convex side wall, said first and second walls being separated by a plurality of solid wall cross ties which form trailing edge coolant passageways therebetween, and a root portion adapted to connect said airfoil portion to a turbomachinery disc, said apparatus comprising:

a blade holding fixture including a casing for forming a chamber around the root portion of said blade, means for sealingly engaging said root portion of said blade while permitting fluid flow communication between said chamber and the internal cavity of said blade, means for supplying pressurized air to said chamber, and means for measuring the pressure within said chamber, and

a blade crimping fixture which receives the airfoil portion of said blade and includes a blade positioning arm for accurately locating and holding said airfoil portions therein and means for crimping the trailing edge portion of said airfoil.

3,866,449

METHOD FOR DIVIDING AN ELONGATED BODY INTO SEPARATE PIECES

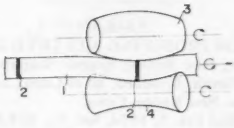
Senzo Wakabayashi; Akira Kusaba; Takayuki Koyano, all of Tokyo; Sukenori Nakano, Sagamihara; Jin-Ichi Kimura, and Akira Oyamada, both of Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Japan

Filed Aug. 10, 1973, Ser. No. 387,280

Claims priority, application Japan, Aug. 24, 1972, 47-84076

Int. Cl. B21d *51/00*

U.S. Cl. 72—70 **17 Claims**



1. In a method of dividing an elongated body of circular section into a plurality of pieces, the steps of forming a plurality of circumferential grooves in the exterior surface of the elongated body between the ends thereof while spacing the circumferential grooves one from the next in accordance with desired lengths of the pieces into which the elongated body is to be divided, sequentially bending the body at the region of sequential grooves thereof while simultaneously rotating the body around its longitudinal axis for breaking the body at the locations of said grooves, and longitudinally feeding the body while simultaneously rotating and bending the latter so that the body is continuously fed and successively broken at successive grooves.

3,866,450

METHOD OF MAKING INTERNAL SHAPES IN METAL OBJECTS HAVING SMOOTH OR TOOTHED ROTATIONAL OUTER SURFACES

Zdzislaw Marciniak, and Zeonon Kopacz, both of Warsaw, Poland, assignors to Polichtechnika Warszawska, Warsaw, Poland

Filed Nov. 27, 1972, Ser. No. 309,911

Claims priority, application Poland, May 23, 1972, 155534

Int. Cl. B21b

U.S. Cl. 72—76 **4 Claims**

1. A method of shaping a plastically deformable hollow sleeve comprising positioning a sleeve on a core within a space defined within a pair of opposed rotatable jaws, providing irregularities on the external surface of the core conforming to the desired internal deformed shape of the sleeve, rotating the jaws around the sleeve along an eccentric path to cause the jaws first to contact the sleeve and deform the sleeve to shape the external surface of the sleeve to the shape of the jaws while simultaneously deforming the inner surface of the sleeve so the material thereof plastically flows and conforms to the irregularities on the outer surface of the core, the jaws

as they continue rotation along their eccentric path then losing contact with the thus shaped sleeve, and axially feeding the core over a feed stroke in the interval of time after the jaws have lost contact with the sleeve and before the jaws resume contact with the sleeve, said irregularities on the core being a screw thread, the axial feed of the core being effected automatically by elastically holding the core against axial displacement while rigidly preventing rotation of the core, the rotation of the jaws on the sleeve producing relative rotation of the sleeve on the core and axial displacement of the core against the elastic holding action, said core axially returning to its initial position by the elastic holding action when the jaws lose contact with the sleeve.

3,866,451

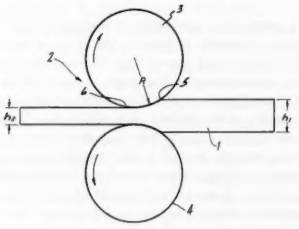
METHOD FOR PRODUCING MULTIPLE GAUGE STRIP

Joseph Winter, New Haven; Eugene Shapiro, Hamden, and Warren F. Smith, Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 4, 1974, Ser. No. 439,519

Int. Cl. B21b *1/10*

U.S. Cl. 72—199 **19 Claims**



1. Method for the preparation of multiple gauge metal strip possessing improved structural quality and dimensional precision which comprises passing the strip through a grooved roll assembly comprising a dimensionally defined grooved upper roll, whereby strip reduction is confined to the area of groove contact and is determined by the ratio of L/W, L is defined as the length of the arc of contact of said upper roll with said strip, and W is defined as the width of the groove, and said L/W ratio is at least about **4.**

3,866,452

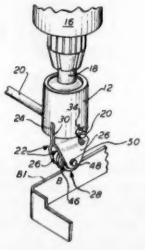
DEBURRING DEVICE

Hildaur L. Neilsen, 2 Juniper St., Metuchen, N.J. 08840

Filed Apr. 29, 1974, Ser. No. 465,275

Int. Cl. B21d *19/04*

U.S. Cl. 72—211 **5 Claims**



1. A deburring device for smoothing an edge of sheet metal and the like, comprising a rotary hammer having a circular, interrupted working surface, a tool including a peening roller formed with a continuous peripheral groove extending therearound, roller supporting means holding said roller in operational relationship to said hammer, and impact-transmitting means coacting between the hammer's said working surface and said roller supporting means to reciprocate the latter and to forcibly impel said roller, in its said groove, into intermittent peening engagement with said edge.

3,866,453

DEVICE FOR TRUEING PIECE ARTICLES OF VARIABLE SECTION

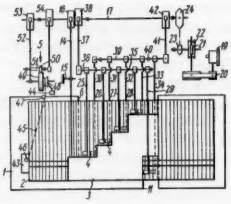
Alexandr Dmitrievich Afanasiev, ulitsa Kubinka, 6, kv. 35, and Alexandr Moiseevich Mogilevsky, 1 Mosfilmovsky perulok, 16, kv. 45, both of Moscow, U.S.S.R.

Filed Apr. 11, 1973, Ser. No. 349,962

Claims priority, application U.S.S.R., Apr. 19, 1972, 1771417

Int. Cl. B21d *3/02, 3/10, 3/16*

U.S. Cl. 72—214 **1 Claim**



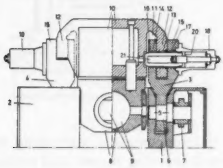
1. A device for trueing piece articles of a variable section, said device comprising: a table for a packet of articles to be laid thereon; a lever being disposed above said table; a clamp being positioned on said lever to hold said packet of articles on said table during trueing; a cam interacting with said lever to lift or lower the latter together with said clamp; a plurality of levelling rollers forming two parallel rows, with a portion of the packet of articles, free from being clamped, being arranged in a gap between said rollers; one of said rows of levelling rollers defining upper ones and being arranged on top of the packet of articles, and the other one of said rows of levelling rollers defining lower ones and being accommodated under the packet of articles; additional levers bearing said upper levelling rollers; an intermediate shaft bearing said levers of said upper levelling rollers; a drive lever secured on said intermediate shaft; a cam interacting with said drive lever for effecting the rotation of said levers of said upper rollers; additional levers bearing said lower levelling rollers; a second intermediate shaft bearing said levers of said lower rollers; a second drive lever secured on said second intermediate shaft; and a second cam interacting with said second drive lever to effect the rotation of said levers of said lower rollers; said table and clamp having lateral sides which are made with stepped through cuts; the steps of said cuts being disposed opposite to each other so as to form a stepped line of a successive bend of the packet of articles when the packet passes in between the rows of the levelling rollers; and upper and lower rollers being accommodated in said cuts.

3,866,454

ROLLING MILL

Hubert Muller, Grevenbroich, Germany, assignor to SIEMAG Siegener Maschinenbau GmbH, Hilchenbach-Dahlbruch, Germany

Filed Nov. 23, 1973, Ser. No. 418,442
Claims priority, application Germany, Dec. 19, 1972, 2262014
Int. Cl. B21b *31/08*
U.S. Cl. 72—238 3 Claims



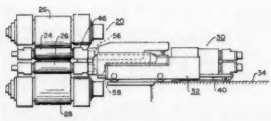
1. A rolling mill having exchangeable sets of rolls, in which the chocks serving for bearing the rolls are releasably coupled by interposed transoms operating through tie shackles with the roll housing, wherein cotter pins serve as coupling means, characterized by the fact that the end of each tie shackle (3, 4) engaging the transoms (10) and the chocks (8) is constructed as a fork (14, 15), between the limbs (14, 15) of which a coupling eye (13) of the transom engages, the cotter pin (21) being insertable in bores (16, 17) in the fork limbs (14, 15) and the coupling eye (18, 19, 20).

3,866,455

MILL ROLL CHANGING SYSTEM INCLUDING A ROLL BUGGY

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Dec. 28, 1973, Ser. No. 429,345
Int. Cl. B21b *31/10*
U.S. Cl. 72—239 11 Claims



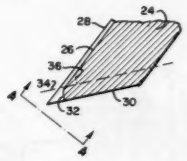
1. A buggy for changing mill rolls and the like, said buggy comprising first and second supports mounted thereon, each of said supports terminating in a roll neck socket adjacent a front or mill end of said buggy, each of said sockets being shaped to closely receive a roll neck of an associated one of said mill rolls and to support said mill roll in cantilevered fashion, means on said buggy for elevating at least one of said supports with respect to said buggy and to the other of said supports so that the distance between said roll neck sockets can be varied, and means for advancing and withdrawing said buggy from said mill for insertion and withdrawal of said mill rolls when so cantilevered.

3,866,456

FELTING NEEDLE

Richard W. Shepard, and Albert S. Ashmead, both of Torrington, Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 217,887, Jan. 14, 1972,. This application July 5, 1973, Ser. No. 376,793
Int. Cl. B21d *43/28*
U.S. Cl. 72—324 5 Claims



1. An apparatus for making a felting needle with a barb having a curved roof, a throat having a flat surface and a concave surface where the throat connects to the barb comprising:

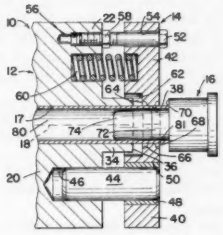
a body having a base adapted to form a throat extending from the needle edge to the base of the barb, a leading face intersecting the base at an acute angle, and a groove formed in the leading face and extending into the base, said groove having the same depth along a major portion of the face to form the curved roof of the barb and a curved portion connecting the major portion of the same depth to the base, said curved portion is adapted to form the concave surface on the needle.

3,866,457

METHOD AND APPARATUS FOR TUBE FORMING

Thomas L. Bagby, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 24, 1973, Ser. No. 391,338
Int. Cl. B21d *15/06*
U.S. Cl. 72—370 10 Claims



1. Apparatus for forming a tube comprising; main block means for holding a first portion of said tube to be formed, floating block means for holding a second portion of said tube to be formed, said floating block means being movable relative to said main block means in a direction coincident with the axis with said tube, said floating block means including spaced-apart first and second counterbore means for receiving third and fourth portions of said tube and forming said third and fourth portions into radially extending ribs on said tube by folding said third and fourth portions upon axial movement of said floating block means toward said main block means, punch means for non-forceable passage into the interior of said first, second, third and fourth tube portions and for axially abutting an axial end section of said fourth tube portion during said axial movement of said floating block means toward said

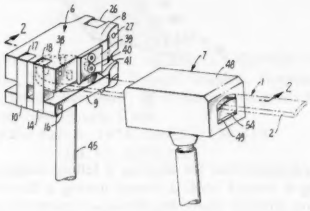
main block means and said folding of said third and fourth portions.

3,866,458

BENDER FOR CONTOURING SURGICAL IMPLANTS

Richard F. Wagner, 62 San Jacinto Way, San Francisco, Calif. 94124

Filed Nov. 12, 1973, Ser. No. 414,811
Int. Cl. B21d *53/00*
U.S. Cl. 72—459 **11 Claims**



11. A bending assembly for use in bending a hip fixation plate comprising a flat bowl-shaped head portion having at least one transverse bore and an integral elongated handle portion having opposed sides, comprising the combination of:

a. a first bender including;
   1. a housing,
   2. a channel extending through said housing, the surface defining one side of said channel being contoured to conform to the contour of one of said opposed sides of said handle portion,
   3. a jaw member disposed within said channel and adapted for vertical movement therein, one side of said jaw member being spaced from said surface defining one side of said channel and being contoured to conform to the contour of the other of said opposed sides of the handle portion,
   4. means interconnecting the side of said jaw member opposite said one side thereof and the housing, and
   5. means for vertically raising and lowering said jaw member within said channel whereby said handle portion may be gripped between said surface defining one side of said channel and said one side of said jaw member and released thereby, respectively; and

b. a second bender including;
   1. an upper jaw having a nipple on its inner surface which registers with and is adapted to be slidably received within said transverse bore,
   2. a lower jaw, the inner surface of which has a protrusion which is adapted to seat snugly against one side of said head portion,
   3. means for pivotally interconnecting said upper and lower jaws at one of their ends, and
   4. means for releasably interconnecting the other of their ends.

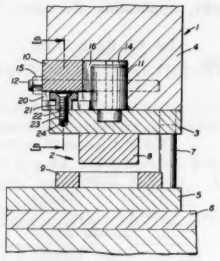
3,866,459

TOP DIE SHOE AUXILIARY RESTRAINT

Philip H. Zepp, and Lawrence R. Mancini, both of North Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Feb. 8, 1974, Ser. No. 440,681
Int. Cl. B21j *13/02*
U.S. Cl. 72—462 **5 Claims**

1. A top die shoe securing means comprising an upper press part having a shank-receiving pocket, a die shoe having a shank adapted to be received in said pocket, a shank-securing means adapted to secure said shank in said pocket, said shank-securing means being restrained against movement with respect to said upper press part parallel to said shank, and auxiliary retaining means restricting movement of said die shoe with respect to said shank-securing means parallel to said shank,



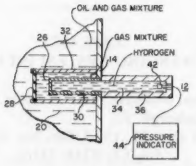
said auxiliary retaining means comprising means carried in part by said shank-securing means and means carried in part by said top die shoe which are movable relative to each other perpendicularly to said shank.

3,866,460

GAS DETECTOR FOR FLUID-FILLED ELECTRICAL APPARATUS

Henry A. Pearce, Jr., Stoneboro, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 30, 1973, Ser. No. 365,339
Int. Cl. G01n *7/10*
U.S. Cl. 73—19 **8 Claims**



1. A gas detector for oil-filled electrical apparatus which indicates the amount of a predetermined gas in the oil, comprising:

a first chamber;

a first diffusion membrane which defines a portion of said first chamber, said gas detector adapted for placement with said first diffusion membrane directly in contact with the oil;

said first diffusion membrane being constructed of a material which permits gas contained in the oil to diffuse through said membrane to equalize the partial pressures of the gases on both sides of said membrane;

a second chamber;

a second diffusion membrane which defines a portion of said second chamber, said second diffusion membrane being located in direct contact with the gaseous atmosphere in the first chamber;

said first and second chambers being sealed for the prevention of any forced fluid flow through the chambers;

said second diffusion membrane being constructed of a material which permits only one predetermined gas which is contained in the gaseous atmosphere to diffuse through said second diffusion membrane to equalize the partial pressures of the predetermined gas on both sides of said second diffusion membrane; and

indicating means for indicating the pressure of the predetermined gas in the second chamber.

3,866,461

PARA-MAGNETIC GAS ANALYZER

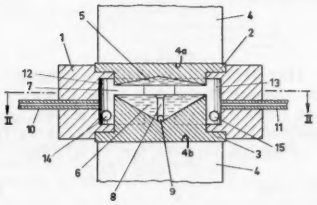
Herbert Machytka, Niederhochstadt, Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt/Main, Germany

Filed Apr. 12, 1971, Ser. No. 133,110

Claims priority, application Germany, Apr. 11, 1970, 2017423

Int. Cl. G01n *7/00, 27/00*

U.S. Cl. 73—23 **6 Claims**



1. In a paramagnetic gas analyzer, wherein an analysis gas and a comparison gas are passed through a magnetic field from different directions and wherein a difference in the paramagnetic characteristics of the gases results in a pressure differential which can be measured, the improvement comprising:

a magnet having two flat and plane-parallel pole faces facing each other at a particular distance;

a housing body made of non-magnetic material and having a bore traversing the body from one of its sides to the respective opposite side;

a first and a second soft magnetic pole piece inserted in the bore respectively from the one side and from the opposite side of the housing body, but leaving a gap between them, the pole pieces each having a flat surface portion, the distance between the flat surface portions as inserted being the same as the particular distance between the pole faces of the magnet, so that the body with inserted pole pieces can be introduced between the pole faces respectively in form-closed, surface to surface engagement respectively of the pole faces with the flat surfaces of the pole pieces so as to magnetize these first and second pole pieces only through said engagement with the magnet;

the bore in the body having lateral recesses defining a pair of chambers which are oppositely located to each other, the recesses each being covered in parts by both of said inserted pole pieces, but being flow conductively interconnected by the gap between the pole pieces, the two gases are respectively introduced into said chambers and flowing into the gap from opposite sides; and

one of the pole pieces having a central discharge conduit bore opening into the gap and turned at right angles in said one pole piece, the housing body having an outwardly open bore in communication with said conduit bore.

3,866,462

SURFACE STRESS MEASURING APPARATUS

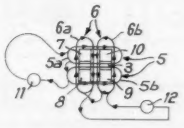
Claude J. Fraudin, Montlignon, France, assignor to Centre D'Etudes et De Recherches De La Machine Outil, Neuilly Sur Seine, Hauts De Seine, France

Filed July 19, 1973, Ser. No. 380,853

Claims priority, application France, July 25, 1972, 72.26758

Int. Cl. G01l *1/12*

U.S. Cl. 73—88.5 R **7 Claims**



1. Apparatus for measuring surface stresses in structures including magnetostrictive material comprising:

a magnetizable body defining at least one group of four poles arranged in two adjacent rows and two adjacent columns, said group of poles being disposed to face a surface of a structure in which stresses are to be measured;

a first coil having first and second serially connected windings supported by said body, each of said first and second windings being wound about a corresponding one of said adjacent rows of poles, said first winding being wound in a first direction and said second winding being wound in a second direction opposite to said first direction;

means for applying alternating current to said first coil to generate a magnetic field, said magnetic field having an orientation such that magnetic flux created by current passing through said first coil is directed from one row of poles in said magnetizable body to said adjacent row through said structure being measured;

a second coil having third and fourth serially connected windings supported by said body, each of said third and fourth windings being wound about a corresponding one of said adjacent columns of said poles; and

means for measuring current in said second coil, said first and second coils being disposed in such relation that magnetic flux produced by said first coil links said windings of said second coil to produce a measurable current flow in said second coil as a function of an altering of the flux distribution between said first and second coils resulting from a change in stress in said structure being measured.

3,866,463

DEVICE FOR TESTING THE TORQUE REQUIRED TO RELEASE A SCREW CAP FROM ITS TIGHTENED POSITION

David A. Smith, Philadelphia, Pa., and Werner L. Tollefsbol, Delran, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 19, 1973, Ser. No. 416,930

Int. Cl. G01l *5/00*

U.S. Cl. 73—99 **5 Claims**

1. A device for testing the torque required to release a screw cap from its tightened position on a container comprising:

a rotary container support for rotating a container,

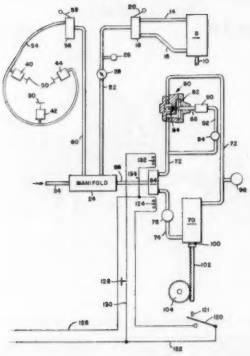
means to hold a cap on said container against rotation,

a fluid actuated ram,

means to connect the ram to the container support for the rotation of said support,

means to supply air at a gradually increasing pressure to one side of the ram to move the ram from a starting position to rotate the container support to loosen the cap,

means actuated by the ram to return the ram to its starting position after the cap has been loosened, and



means to indicate the torque applied to the rotary container support, said last-mentioned means being pressure actuated.

3,866,464

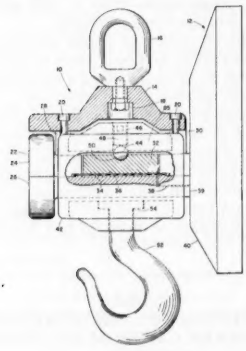
HYDRAULIC LOAD INDICATOR

Samuel H. Franklin, Box 45181, Tulsa, Okla. 74145

Filed Sept. 4, 1973, Ser. No. 393,933

Int. Cl. G01l *1/02*

U.S. Cl. 73—141 R **6 Claims**



1. A device for insertion between an upwardly and downwardly extending line for measuring the tensile load comprising:

a plate having a hydraulic fluid filled cavity in the upper surface thereof and a conduit opening communicating with the cavity;

a diaphragm sealably covering said cavity;

a cylindrical piston, the lower surface of which engages said diaphragm, the piston having an axially positioned spherical recess in the upper surface thereof;

an upper line receiving means for securing an upwardly extending line thereto, said upper line receiving means being secured to said plate;

a yoke member having an upper horizontal portion extending above said piston, said yoke member being movable relative to said plate, the yoke member horizontal portion having a recess in the lower surface thereof in vertical alignment with said spherical recess in said piston;

a lower line receiving means adaptable to receive a downwardly extending line, the lower line receiving means being attached to said yoke member;

a ball positioned in said recess in said yoke member horizontal portion and said cylindrical spherical recess in said piston, the tensile force applied by said lower line receiving means being applied by said ball against said piston; and

a hydraulic pressure actuated indicating instrument supported to said plate and having communication with said conduit, the instrument being calibrated to reflect the tensile load applied between said upper and lower line receiving means.

3,866,465

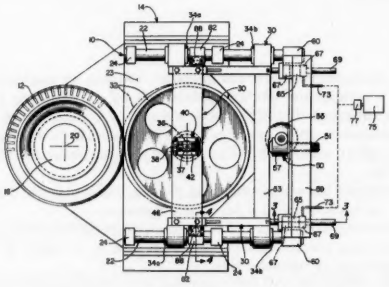
TIRE FORCE VARIATION MACHINE

Richard P. Marshall, Tallmadge; James E. Rice, Cuyahoga Falls, and James D. Stokes, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 14, 1974, Ser. No. 432,931

Int. Cl. G01m *17/02*

U.S. Cl. 73—146 **6 Claims**



1. In an apparatus for measuring force variations of a tire, which apparatus includes means for mounting a tire for rotation about a first axis fixed relative to said frame, a load wheel carriage, means mounting said carriage on said frame for movement along a fixed path toward and away from said first axis, a load wheel, means rotatably mounting said load wheel on said carriage for rotation about an axis parallel to said first axis, and drive means for moving said carriage toward and away from said first axis;

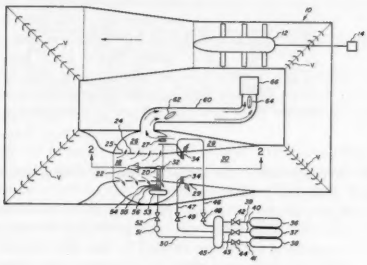
the improvement comprising carriage locking holding means independent of said drive means and including a first member rigidly fixed relative to said frame and a second member rigidly secured to said carriage, the first and second members being engageable to prevent relative movement therebetween, said first and second members being disengageable to permit relative movement therebetween in a direction parallel to said fixed path, and control means for controlling selectively the engagement and disengagement of said first and second members.

3,866,466

METHOD AND APPARATUS FOR INCREASING THE REYNOLDS NUMBER CAPABILITY IN A TRANSONIC WIND TUNNEL

Ray W. Cotter, Amherst, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Aug. 30, 1973, Ser. No. 393,091
Int. Cl. G01m 9/00
U.S. Cl. 73—147 16 Claims



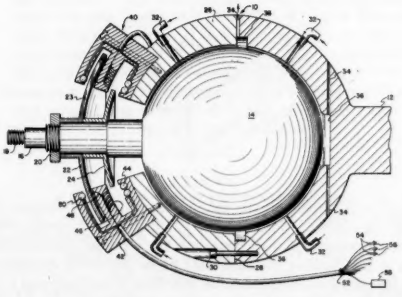
1. A method for increasing the Reynolds number capability in a closed loop wind tunnel including the steps of:
- circulating air through the wind tunnel;
- withdrawing air from the boundary layer of a first portion of the wind tunnel which defines a test section so as to control boundary layer build up;
- exhausting the air withdrawn from the boundary layer of the test section; and
- injecting high energy air into the wind tunnel at a point downstream of the test section whereby blockage due to boundary layer build up is reduced, the air mass flow is maintained and the operating range of the wind tunnel is extended.

3,866,467

WIND TUNNEL MODEL SUPPORT AND MEASURING SYSTEM WITH THREE-DEGREES-OF-FREEDOM

Eugene V. Horanoff, Clarksville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1973, Ser. No. 333,914
Int. Cl. G01m 9/00
U.S. Cl. 73—147 6 Claims



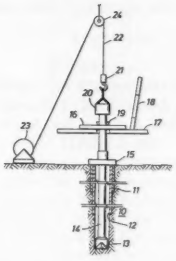
1. A wind tunnel model support and scale having three-degrees-of-freedom comprising:
- a socket attached to a sting support in the wind tunnel;
- a sphere connectable to a model and rotatably receivable within said socket;
- an air film between said socket and said sphere to permit frictionless relative movement; and
- a fiber optic measuring system coupled to said socket and said sphere for indicating displacements of said model, including:
- a light source affixed to said socket adjacent said sphere and located on each of the pitch and yaw axes;
- a plurality of light guides having one end of each capable of illumination by said light source; and
- a plurality of photoelectric pickups, one in proximity to each of the other ends of said plurality of light guides for indicating the presence of light in said light guides,
- whereby movements of said model relative to the pitch, yaw, and roll axes are sensed and transmitted to a position outside the wind tunnel.

3,866,468

DRILL PIPE MONITORING SYSTEMS

Hubert Irvin Smith, and Fred L. Ott, both of Houston, Tex., assignors to Drill-Au-Mation, Inc., Houston, Tex.

Filed Oct. 4, 1972, Ser. No. 294,963
Int. Cl. E21b 47/00
U.S. Cl. 73—151 14 Claims



1. A method for monitoring the speed of pipe relative to a well bore comprising the steps of:
- producing a first electrical signal as a function of the actual speed of the pipe as it moves relative to a well bore,
- producing a second electrical signal as a function of a desired speed value,
- comparing said first and second electrical signals and producing at least one electrical output signal as a function of the pre-established difference between said first and second electrical signals, and
- applying said one output signal to an alarm means.

3,866,469

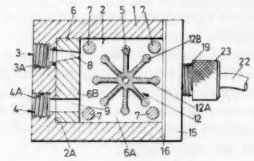
RECTANGULAR FLOWMETER

William Alexander Wemyss, Great Missenden, England, assignor to B. Rhodes & Son Limited, Romford, Essex, England

Filed Dec. 13, 1973, Ser. No. 424,536
Claims priority, application Great Britain, Dec. 13, 1972, 57518/72; Apr. 10, 1973, 17141/73
Int. Cl. G01f 1/06
U.S. Cl. 73—229 13 Claims

1. A fluid flowmeter comprising:
- a body defining a chamber of substantially rectangular cross-section having four side walls extending between substantially parallel top and bottom walls;
- a metering rotor having radially-directed, axially extending blades borne for rotation with said chamber;
- means defining a fluid inlet and a fluid outlet, opening to said chamber through the same of different side walls of the chamber;
- said inlet including a nozzle for directing a jet of incoming fluid towards and substantially tangential to the rotor;

means arranged within the chamber for guiding such incoming fluid around the chamber to the outlet which means comprises:



a rod like member extending between said top and bottom walls of the chamber situated in one or more corners of the chamber, the axis of the or each such member being substantially parallel with that of the rotor;

and means for sensing the number of revolutions of the rotor to signal the amount of fluid passed.

3,866,470

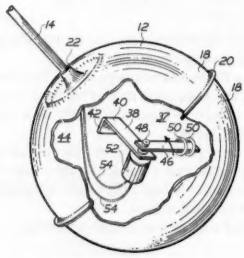
SELF-CONTAINED FLOAT DEVICE

Bernard J. Miller, Andorra Rd., Lafayette Hills, Pa. 19444

Filed Jan. 8, 1973, Ser. No. 321,887

Int. Cl. G01f *23/10*

U.S. Cl. 73—313 **3 Claims**



1. A self-contained float device for providing a signal which is indicative of a liquid level, the device comprising a float that has a hollow interior, a support arm extending from the float and being pivotably secured to first support means to allow the float to rise and fall with the change of liquid level in float displacement, the improvement comprising, sensing means disposed and sealed entirely within the hollow float interior and remote means disposed at a remote location outside said float, said sensing means comprising electrical means the language electrically connected to said remote means and for providing an electrical signal thereto, said signal being indicative of float displacement, second support means mounted on the interior of the float, and a pivotably mounted arm mechanically connected to said electrical means, said arm being gravity responsive, whereupon any change in float displacement causes said arm to pivot to thereby effect a corresponding change in the electrical signal provided by said electrical means to said remote means.

3,866,471

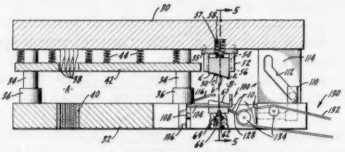
PROGRESSIVE DIE

William M. Carroll, Milwaukee; Guntis M. Aulis, and Francis C. Starr, both of Menomonee Falls, all of Wis., assignors to Kaller Die & Tool Company, Milwaukee, Wis.

Filed Dec. 3, 1973, Ser. No. 420,963

Int. Cl. B21d *28/00*

U.S. Cl. 72—337 **8 Claims**



1. A progressive die for stamping, forming and stacking metal piece parts comprising:

a. an upper and lower die shoe adapted to be mounted in a vertically reciprocal press and to receive flat sheet metal;

b. opposing die means carried by said die shoes for simultaneously forming a plurality of parts in said sheet metal;

c. forming dies carried by said die shoes for receiving and performing metal working operations upon said parts, and said dies including vacuum means for positively holding said simultaneously formed parts vertically disposed relative to one another; and

d. horizontally reciprocable cam operated stacking means carried by one of said die shoes cooperating with said vacuum means for stacking said parts and ejecting same from said die.

3,866,472

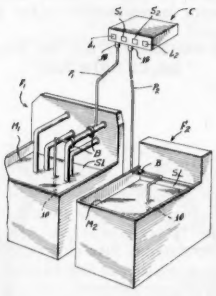
PROBE ASSEMBLY

Allan E. Witt, Westport, Conn., assignor to Food Automation Service Techniques, Inc., Stratford, Conn.

Filed June 15, 1973, Ser. No. 370,413

Int. Cl. G01k *1/14*

U.S. Cl. 73—362 AR **6 Claims**



1. A probe assembly for use in a deep fat fryer wherein the length of cooking time is to be calculated by a timing computer responsive to the temperature in a predetermined location in the cooking medium, said probe assembly including

a first portion arranged to be attached to the fryer and to be partly immersed in the cooking medium,

comprising a deformable closed end sleeve adapted to be bent to a predetermined shape to conform to the contours of the fryer and to thereafter retain said shape,

said sleeve being formed of a smooth-surfaced metal impervious to said cooking medium,

a temperature sensing element fixedly positioned within said sleeve at said closed end,

flexible temperature-resistant leads within said sleeve leading from said temperature sensing element to the opposite end of said sleeve, and

means for removably attaching said sleeve to the fryer, and a second portion arranged to be attached to the timing computer and being flexible and heat-resistant, comprising a flexible shell sealingly connected to said opposite end of the sleeve,

said shell being formed of a smooth-surfaced metal impervious to said cooking medium,

flexible temperature resistant leads within said shell joining with the leads in said sleeve, and

means at the end of said second portion for fixedly but removably securing said second portion to said timing computer and for interconnecting said electrical leads with said computer,

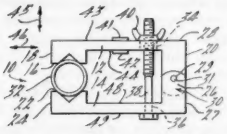
whereby the location of the fixed end of said sleeve may be accurately and repeatedly positioned in said predetermined location in said cooking medium, thereby providing a uniform temperature data input to said computer despite repeated removal of said sleeve from the fryer for cleaning.

3,866,473

PRESSURE MEASURING TRANSDUCER

Bernard R. Teitelbaum, Birmingham, and Lawrence E. Slimak, Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 4, 1969, Ser. No. 847,225
Int. Cl. G01l *9/02*
U.S. Cl. 73—398 AR **29 Claims**



1. A transducer for detecting pressure exerted upon the periphery of an elastically deformable enclosure comprising:

a member elastically deformable in response to deformation of the periphery of the enclosure;

means drivingly engaging said member with the periphery of the enclosure including a second member which cooperates with said first mentioned member to grip the enclosure therebetween, and also including means pivotally connecting said members and means to adjustably secure the enclosure between said members; and

deformation detecting means adapted to detect deformation of said first member to thereby detect pressure exerted on the periphery of the enclosure.

3,866,474

GAS SAMPLE COLLECTING DEVICE

Detlev E. M. Hasselmann, Pasadena, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed June 25, 1973, Ser. No. 372,905
Int. Cl. G01n *1/22, 1/24*
U.S. Cl. 73—421.5 R **5 Claims**

1. Gas sample collecting apparatus, comprising:

A. a closed, rigid-walled container provided with an opening and a cover for hermetically sealing and unsealing said opening;

B. a carton nested within said container and smaller in size relative thereto to permit insertion of said carton within said container and withdrawal therefrom through said opening;

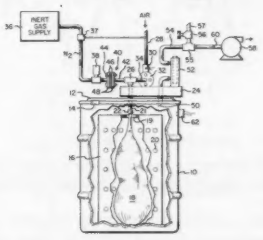
C. a flexible gas sample bag within said carton and having a neck through which gas may be introduced;

D. said carton being stiff in construction and substantially closed except for the provision of an outlet for accommodating the neck of said sample bag and of a multiplicity of holes for permitting ready exhaust of the interior thereof and of the space between said carton and said container and to limit expansion of said sample bag to the volume enclosed thereby;

E. a source of pressurized inert gas;

F. a first gas flow path for conducting said inert gas to a common junction;

G. a second gas flow path for conducting sample gas to said common junction where it is mixed with said inert gas;



H. a third gas flow path extending from said common junction to said sample bag for conducting the mixture of inert gas and sample gas to said sample bag;

I. means in said first and second gas flow paths including means coupled therebetween for adjusting the relative flow rates of said inert gas and said sample gas to attain a desired dilution ratio; and

J. an exhaust system for evacuating the space between the exterior of said sample bag and the interior walls of said container so as to cause said sample bag to fill with said gas mixture to a volume limited by the interior of said carton;

K. means for sealing the neck of said gas sample bag, said bag being separable from said third gas flow path upon filling with said gas mixture, thereby to permit removal of said carton containing said sealed and gas filled sample bag from said container.

3,866,475

STACK SAMPLING METHOD AND APPARATUS

Stanley P. Thompson, 2718 Osborn, Topeka, Kans. 66614, and Thomas B. Swearingen, 4326 Berini Dr., Durham, N.C. 27705

Filed Nov. 19, 1973, Ser. No. 416,927
Int. Cl. G01n *1/22*
U.S. Cl. 73—421.5 R **7 Claims**

1. Apparatus for achieving isokinetic sampling of a gas passing through a conduit, said apparatus comprising:

a reference duct positioned in said conduit,

said reference duct being open at opposite ends for the unimpeded flow of gas therethrough;

a sampling duct disposed adjacent said reference duct within said conduit,

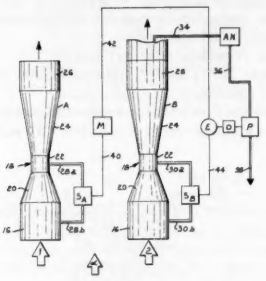
said reference and sampling ducts having like flow constants (c) and a velocity coefficient (k);

vacuum pumping means coupled with said sampling duct for causing the flow of gas therethrough;

first pressure sensitive means for monitoring the pressure drop between two points in said reference duct and converting the pressure drop value into a first electrical signal;

second pressure sensitive means for monitoring the pressure drop between two points in said sampling duct and converting the pressure drop value into a second electrical signal;

means for scaling the first electrical signal by a factor directly proportional to $(1/k)^2$ to provide an electrical output signal; and



means for comparing the second electrical signal with the electrical output signal to provide an electrical difference signal;

said vacuum pumping means being operable in response to said electrical difference signal to cause the velocity of the gas passing through the sampling duct to equal the velocity of the gas passing through the conduit.

3,866,476

ANALYTICAL APPARATUS

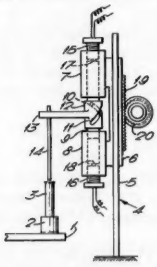
Alan John Thomas, Richmond, England, assignor to The Rank Organisation Limited, London, England

Filed Aug. 9, 1973, Ser. No. 386,885

Claims priority, application Great Britain, Aug. 9, 1972, 37076/72

Int. Cl. G01n *1/14*

U.S. Cl. 73—423 A **7 Claims**



1. Apparatus for automatically sampling liquids, comprising:

conveying means for conveying liquid to be sampled to a sampling station,

a sampling probe,

movable support means for said sampling probe, said support means being movable to transfer said probe between said sampling station and a washing station,

washing means at said washing station,

driving means driving said movable support means to transfer said probe from said washing station to said sampling station and back to said washing station, said driving means operating to cause said probe to move in separate consecutive steps of alternate vertical and horizontal movement and including at least one rotary solenoid for effecting each step of said motion, and

a plurality of sensor means disposed in positions to detect when each said vertical or horizontal step of said movement of said probe is completed, said sensor means operating to energise said drive means to intitiate a subsequent step of said movement upon detection of completion of a preceding step thereof.

3,866,477

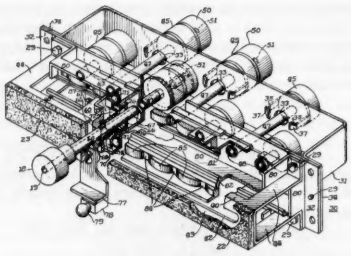
SINGLE KNOB, MULTIFUNCTION CONTROL ASSEMBLY FOR A TELEVISION RECEIVER

Richard G. Schmid, Glenview, and Otto H. Schwartz, Rolling Meadows, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 2, 1973, Ser. No. 384,877

Int. Cl. H03j *1/04;* **F16d** *21/00;* **F16h** *35/18*

U.S. Cl. 74—10.45 **12 Claims**



1. A television receiver having a control assembly including at least three viewer operable potentiometers each having an adjustable element, and a slidable master shaft assembly, including a master shaft for selectively adjusting said elements, said control assembly comprising:

frame means for supporting said potentiometers with said adjustable elements arranged in a line, and defining a corresponding plurality of separate tuning positions for adjustment of said potentiometers;

guide means permitting movement of said master shaft assembly to said tuning positions;

means normally biasing said master shaft out of engagement with said adjustable elements; and

means for mechanically coupling said master shaft to the selected one of said adjustable elements for adjustment of its corresponding potentiometers.

3,866,478

RECIPROCATING MOTION CONTROL DEVICE

Leighton R. McKeen, 877 Mamie Rd., El Paso, Tex. 79932

Filed Nov. 21, 1972, Ser. No. 308,390

Int. Cl. F16h *21/32;* **D05b** *69/22*

U.S. Cl. 74—40 **2 Claims**

1. In a device for converting rotary to reciprocating motion comprising:

a rotary drive means;

a work element mounted for reciprocation between first and second locations;

a lever arm pivotably mounted intermediate its ends and connected at one end to said work element;

a crank arm pivotably connected at one end to said rotary drive means;

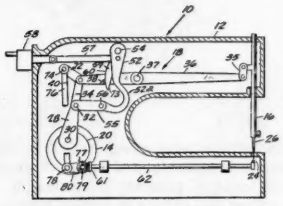
a pitman, pivotably connected between said crank and the other end of said lever, to convert the rotary motion of said drive means to an oscillating motion on said lever arm;

a control lever pivotably mounted to said device and disposed to be skew with said lever arm;

first means for selectively moving said control lever between a first and second position;

a control link pivotably connected at one end to said control lever and at its other end to said crank arm at said point of connection between the crank arm and said pitman; and

said control lever and said control link cooperating in said first position to hold the line of thrust of said pitman substantially perpendicular to said lever arm to oscillate it, and cooperating in said second position, to hold the line of thrust of said pitman substantially in a line with said lever arm to hold it stationary;



the improvements comprising:

a lug formed on said lever arm and disposed between said other end of said lever arm and its pivotal mount;

said control lever having a cam, with a cylindrical camming surface disposed to cooperate with said lug; and

said cylindrical camming surface having its center of curvature disposed at the pivotal mount of said lever arm and said surface extends a distance shorter than the arcuated travel path of said lug whenever the control lever is in said first position.

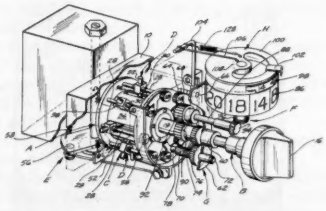
3,866,479

TUNER DRIVE ASSEMBLY FOR SELECTING A LIMITED NUMBER OF CHANNELS IN THE UHF BAND

Carroll R. Miner, Wilbraham, Mass., assignor to General Instrument Corporation, Newark, N.J.

Filed Nov. 19, 1973, Ser. No. 417,142

U.S. Cl. 74—10.85 **9 Claims**



1. A tuner drive assembly for use with a tuning mechanism having a rotary control shaft comprising a housing, a rotatable input shaft mounted on said housing, a rotatable turret situated in said housing and operably connected to said input shaft to be driven thereby, said turret comprising first and second spaced end sections with a screw element rotatably mounted therebetween, said element having a threaded portion, means for rotating said element, an internally threaded member normally engaging said portion and axially movable by rotation of said element, said portion being spaced from said end sections respectively by a distance slightly less than the distance between the last thread on said member to engage said portion and the opposite end of said member therefrom, means for permitting said member too disengage from said portion when said element is rotated in a direction to move said member adjacent one of said end sections and effective when disengagement occurs to urge said member and said portion together to cause re-engagement thereof when said element is rotated in the opposite direction and sensing means for sensing the axial position of said member, said sensing means being operably connected to said control shaft to rotate same in accordance with the position of said member.

3,866,480

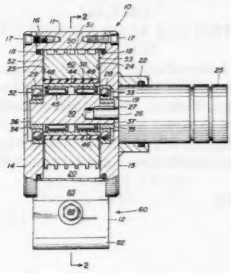
ORBITAL VIBRATOR

Thomas L. Elliston, Hurst, Tex., assignor to Martin Concrete Engineering Company

Filed June 2, 1972, Ser. No. 259,043

Int. Cl. F16h *33/10*

U.S. Cl. 74—87 **14 Claims**



1. An orbiting mass vibrator comprising:

rotor assembly means including an enclosure defining a rotor chamber and cylindrical rotor means having a circular periphery and flat side faces including means associated with at least one side face defining hydrodynamic bearing means, said rotor means being constrained by said chamber,

drive means adapted to drive said rotor in an orbital path about said chamber,

fluid pressure relief means associated with said rotor assembly means, said pressure relief means adapted to relieve the fluid pressure between said rotor and chamber as the rotor orbits within the chamber thereby reducing the dynamic separation between the rotor and chamber.

3,866,481

TORQUE-LOADING DEVICE

John R. Fuchs, Leawood, Kans., assignor to General Motors Corporation, Detroit, Mich.

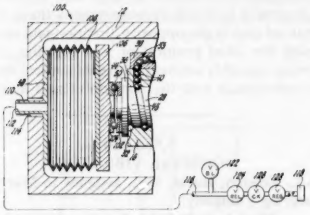
Filed Oct. 23, 1973, Ser. No. 408,330

Int. Cl. F16h *27/02*

U.S. Cl. 74—89.15 **3 Claims**

1. A device for providing torque-loading of a rotary power tool, said device comprising a housing, a sleeve member mounted in said housing, a shaft rotatably mounted through said sleeve member, circumferentially aligned spiral grooves formed in said sleeve member and on said shaft, said spiral grooves cooperating to form a spiraling conduit throughout the length of said sleeve member, a plurality of balls operatively connected to said spiraling conduit, said cooperating balls and spiralling grooves serving to change rotary movement of said shaft to axial movement thereof in response to torque applied to the exposed end of said shaft, bellows means mounted in said housing intermediate an end wall thereof and the inner end of said shaft and arranged to provide a counter-

force to said axial movement of said shaft, a source of fluid under pressure for said bellows means, and means for varying



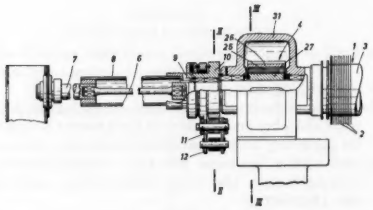
the pressure of said fluid within said bellows means to predetermined levels.

3,866,482

DRIVE SYSTEM FOR REED ROLLER OF WEAVING MACHINE

Walther Filter, Langenhagen, Germany, assignor to Vereinigte Osterreichische Eisen-Und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed July 17, 1973, Ser. No. 380,064
Claims priority, application Austria, Aug. 8, 1972, 6849/72
Int. Cl. F16h *27/02*
U.S. Cl. 74—128 **8 Claims**



1. A drive system for intermittently rotating a reed roller incorporated in a flat weaving machine, which system comprises

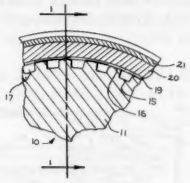
1. a unidirectionally rotatably mounted reed shaft corotationally connected to the reed roller, the reed roller including a multiplicity of reed discs provided with dogs,
2. a torsion bar coaxial with the reed shaft and having first and second ends,
   a. the first end of the torsion bar being corotationally connected to one end of the reed shaft,
3. actuating means connected to the second end of the torsion bar and operable to rotate the second end of the torsion bar in the direction of rotation of the reed shaft,
4. a one-way coupling operatively connecting the actuating means to the second end of said torsion bar for the unidirectional rotation thereof,
   a. the actuating means holding the second torsion bar end in the rotated position,
5. a ratchet wheel corotationally connected to the reed shaft,
6. a locking pawl movable into and out of locking engagement with the ratchet wheel, and
7. means for holding the locking pawl in locking engagement with the ratchet wheel to hold the reed shaft against rotation during the rotation of the second end of said torsion bar by the actuating means and thus to twist the torsion bar, and for moving the pawl out of locking position with the ratchet wheel to permit the twisted torsion bar to rotate the reed shaft unidirectionally.

3,866,483

DRIVE BELT CONSTRUCTION

Thomas R. Smith, 710 W. 11th St. S., Newton, Iowa 50208

Filed Mar. 6, 1974, Ser. No. 448,704
Int. Cl. B29h *7/22*; **F16g** *1/22*, *1/28*
U.S. Cl. 74—231 C **14 Claims**



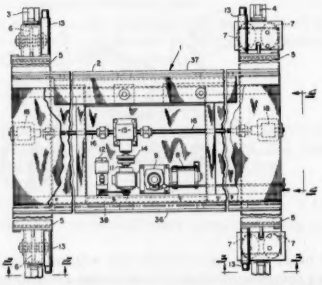
1. A method of fabricating a reinforced drive belt comprising: assembling at least one loop of polyurethane material and a plurality of loops of generally nonextensible reinforcing material on a form that defines an endless groove, said loops of reinforcing material being placed in said groove for engagement with one surface of said loop of polyurethane material and with successive loops being spaced and electrically insulated from adjacent reinforcing loops; assembling a compression band over said reinforcing and polyurethane material; heating said polyurethane material to effect a softening thereof for embedding the loops of reinforcing material in the polyurethane material; cooling the polyurethane material; and removing the compression band and the fabricated belt from the form.

3,866,484

RACK AND PINION ACTUATED MACHINE

Roy H. Dreshman, Munhall, Pa., assignor to R. H. Dreshman & Sons, Inc., Homestead, Pa.

Continuation of Ser. No. 69,421, Sept. 3, 1970, abandoned, which is a division of Ser. No. 749,356, Aug. 1, 1968, Pat. No. 3,608,878. This application June 22, 1973, Ser. No. 372,766
Int. Cl. B23k *7/10*; **B61c** *11/04*; **F16h** *1/04*
U.S. Cl. 74—422 **4 Claims**



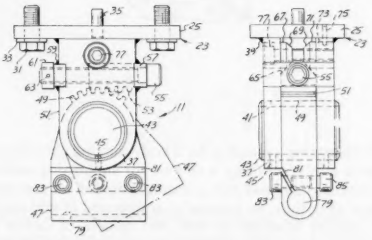
1. A machine for movably carrying a flame-cutting torch and the like comprising a carriage; a pair of essentially parallel rails supporting said carriage on wheels for horizontal movement longitudinally therealong, said wheels forming a lateral interlock on at least one rail to maintain the carriage on the rails, each rail having on one side thereof a longitudinally extending gear rack with generally vertically extending teeth having their pitch lines disposed in a vertical plane; drive gears having vertical axes and transversely horizontally movable

support means therefor on said carriage to maintain said gears in meshing engagement with the respective racks despite deviation of said rails from true parallelism in a horizontal plane.

3,866,485
ANGULAR ADJUSTMENT MOUNT FOR A WORKPIECE EXTRACTOR

Leland F. Blatt, 31915 Grolsbeck, Grosse Pointe Shores, Mich. 48026

Filed Oct. 3, 1973, Ser. No. 403,034
Int. Cl. F16h *1/04*
U.S. Cl. 74—422 **4 Claims**



1. An angular adjustment mount for a workpiece extractor comprising a body assembly including a support plate adapted for mounting upon the reciprocal carriage of a shuttle unit, and a pair of spaced hanger plates secured thereto and depending therefrom;

a tube spanning and extending through corresponding opposed apertures in said hanger plates and secured thereto; a hanger mount having a transverse bore mounted over and receiving said tube, pivotally mounted thereon and interposed between and depending from said hanger plates;

there being a longitudinal bore through said hanger mount at one ene adapted to supportably receive and mount the hanger rod of a workpiece gripping jaw support;

there being an angular slit portion through said hanger mount extending to its bore to facilitate assembly of said hanger rod therethrough;

fasteners extending through the slit portion of said hanger mount threadedly engaging said hanger mount for drawing up the slit portion to secure said hanger rod thereto; a rack pinion segment on said hanger mount concentric to its pivotal mounting;

an adjusting rack guidably mounted upon said hanger plates in mesh with said pinion;

means to adjust said rack relative to said pinion segment for effecting angular adjustment of said hanger mount;

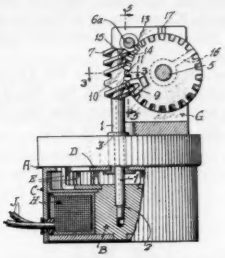
and means for securing said rack in adjusted position.

3,866,486
ONE-WAY ROTATION CONTROL FOR SYNCHRONOUS MOTOR SHAFTS

Walter L. Lechner, New Providence, N.J., assignor to Engler Instrument Company, Jersey City, N.J.

Filed Oct. 9, 1973, Ser. No. 404,621
Int. Cl. F16h *1/16, 55/04*
U.S. Cl. 74—425 **8 Claims**

1. The combination with the shaft of a synchronous motor that is capable of starting in either direction, of a worm on said shaft to rotate therewith, and a gear rotatable about an axis perpendicular to the axis of said shaft and meshing with said worm providing upon energization of the motor for free rotation of the shaft and said gear in one direction, said worm and

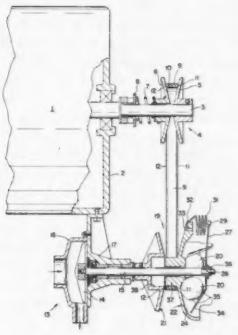


said gear having portions coactive to block rotation of the shaft in the opposite direction.

3,866,487
PULLEY DRIVE SYSTEM

Grahame Russell Key, Aylesbury, England, assignor to The Hoover Company, North Canton, Ohio

Filed Apr. 6, 1973, Ser. No. 348,765
Claims priority, application Great Britain, May 1, 1972, 20170/72
Int. Cl. F16h *55/22*
U.S. Cl. 74—230.17 E **7 Claims**

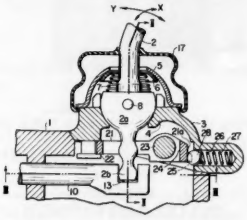


1. A pulley drive system comprising a drive pulley assembly, a driven pulley assembly, a belt coactively connecting said pulley assemblies, said driven pulley assembly being formed of first and second half-pulleys, said half-pulleys being relatively rotatable and relatively axially movable, said first half-pulley being adapted to drive associated apparatus, a belt-receiving portion structurally integral with said second half-pulley whereby rotary motion is imparted to said second half-pulley by said belt, said belt bearing upon said belt-receiving portion and being spaced from said first half-pulley when said second half-pulley is driven below a predetermined speed so that said belt does not contact said first half-pulley, and a centrifugal mechanism associated with said second half-pulley to impart axial movement to said second half-pulley upon said belt driving said second half-pulley at a predetermined speed to bring said belt into contact with said first half-pulley to drive said first half-pulley.

3,866,488
MANUALLY OPERATED SHIFT ASSEMBLY WITH RESTRAINING ACTION FOR SHIFTING TO REVERSE

Tadao Nakata; Hideaki Mizutani; Shinichi Ito; Mitsuhiko Okada, and Nobuaki Katayama, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota Aichi-ken, Japan

Continuation of Ser. No. 325,257, Jan. 22, 1973, abandoned. This application Oct. 29, 1973, Ser. No. 410,402
Claims priority, application Japan, Jan. 24, 1972, 47-8284
Int. Cl. G05g 5/10, 9/12
U.S. Cl. 74—475 13 Claims

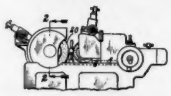


1. In a transmission including a gear case arranged to contain change gears, at least two fork shaft positioned within said gear case in side-by-side relationship and each arranged to be axially displaceable in the opposite directions from a neutral position for effecting a speed change in the change gears, each said fork shaft having a recess with the recesses arranged in side-by-side relationship in the neutral position, manually operable first means mounted in said gear case and arranged for selective engagement within said recesses in said fork shaft for selecting one of said fork shafts in the neutral position for shifting from the neutral position in the axial direction of the selected fork shaft for changing gears, wherein the improvement comprises interlocking means for preventing said two fork shafts from being axially displaced at the same time, a first one of said two fork shafts providing a forward gear position and a reverse gear position disposed in spaced relationship in the axial direction of the shaft on the opposite sides of the neutral position thereof, the second one of said two fork shafts providing two forward gear positions arranged in spaced relationship in the axial direction of the fork shaft on the opposite sides of the neutral position, said recess in said first fork shaft having a pari of opposed sides spaced apart in the axial displacing direction with one side located closer to the reverse gear position and the other side located closer to the forward gear position, said recess in said second fork shaft having a pair of opposed sides spaced apart in the axially displacing direction with one of said sides thereof aligned in the neutral position with the reverse shift position side of the recess in said first fork shaft when it is in the neutral position, said one of said sides extending toward the recess in said first fork shaft beyond the end of the other said side thereof closer to the recess in said first fork shaft, second means in operative association with said first means for affording a limitation on the movement of said first means from the recess in said second fork shaft into the recess in said first fork shaft so that in addition to the effort required for axial displacement needed for movement from the neutral position into the forward gear position of said first fork shaft at least one restricting action is provided to be overcome for displacing said first means for shifting from the neutral position to the reverse gear position of said first fork shaft, and the restricting action of said second means limiting the displacement of said first means into the recess in said first fork shaft so that said first means contacts said extension on the one said side of the recess in said second fork shaft and said interlocking means operates to prevent said first fork shaft from being displaced into the reverse gear position until the restricting action is overcome and said first means is moved out of contact with said extension.

3,866,489
DYNAMIC BALANCING APPARATUS

Rudolf Johan Kimmelaar, Vlaardingen, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 16, 1973, Ser. No. 416,689
Int. Cl. B24b 41/04
U.S. Cl. 74—573 5 Claims

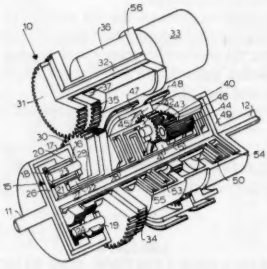


1. A balancing apparatus for a body rotating about a predetermined axis comprising a spindle for supporting said body for rotation about said axis, a casing mounted on said spindle adjacent said body, an internal gear disposed in said casing in fixed, coaxial relationship with said spindle, a carrier journaled in said casing for rotation about the axis of said spindle, a pinion gear journaled in said carrier and meshing with said internal gear, a balancing mass attached to said pinion gear with its center of gravity eccentric to the axis thereof, and selectively operable means for rotating said carrier relative to said spindle thereby causing the center of gravity of said mass to describe a hypocycloidal path in a plane normal to the axis of said spindle.

3,866,490
SPLIT POWER TRANSMISSION

Elias Orshansky, Jr., San Francisco, Calif., assignor to Orshansky Transmission Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 443,790, Feb. 19, 1974, , and a continuation-in-part of Ser. No. 361,178, May 17, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,541
Int. Cl. F16h 47/04
U.S. Cl. 74—687 73 Claims



1. A power transmission comprising:
input means,
output means,
a planetary gear assembly having an input member connected to said input means, two output members, and a reaction member,
means for successively connecting each said output member to said output means to drive said output means through a preselected speed range,

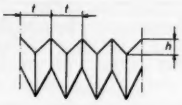
means for disconnecting each said output member from the output means after the other output member has been connected thereto, and

speed-varying means at all times in driving engagement with said reaction member and at all times in driving engagement with the same said output member and only that said output member.

3,866,491
STAMPING KNIFE

Gustav Marchard, Waidhofen/Ybbs, Austria, assignor to Gebr. Bohler & Co. AG, Vienna, Austria

Division of Ser. No. 289,752, Sept. 15, 1972, Pat. No. 3,824,887. This application Jan. 2, 1974, Ser. No. 429,857
Int. Cl. B23p *15/28*
U.S. Cl. 76—101 R **3 Claims**



1. A process of manufacturing a stamping knife which comprises a knife body and a cutting edge which is carried by said knife body and formed with a series of teeth, each of which has a root merging into said knife body and a tip spaced from said knife body, adjacent ones of said tips being spaced 0.5–5 millimeters apart, each of said teeth having a depth of up to 5 millimeters, measured from its tip to its root, each of said teeth increasing in hardness from its tip to its root, each of said teeth having at its root at least the same hardness as the adjacent portion of said tooth body, which process comprises

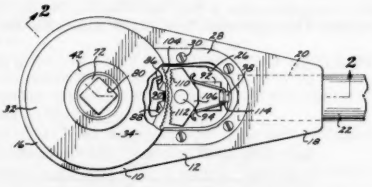
hardening said knife to impart to said teeth a hardness of HRC 43–46 at their tips and of HRC 48–55 at their roots, and

tempering said knife after it has thus been hardened.

3,866,492
TORQUE MULTIPLIER

William A. Knoll, Santa Ana, Calif., assignor to Jo-Line Tools, Inc., Anaheim, Calif.

Filed Mar. 6, 1974, Ser. No. 448,455
Int. Cl. B25b
U.S. Cl. 81—52.4 R **11 Claims**



1. A torque multiplier tool with a torque limiting mechanism which comprises:

a. a housing having a through opening;

b. a planetary cage rotatably carried in said through opening and formed of a work-receiving member and an opposite spider member with a plurality of planetary gears rotatably mounted therein;

c. shaft means coaxially carried by said spider member and bearing pinion means engaged as a sun gear with said planetary gears;

d. a ring gear mounted in said through opening, surrounding and engaged with said planetary gears and bearing a detent on its outer periphery;

e. first and second toggle members carried by said housing with resilient means biasing said toggle members into an in-line relationship with said first toggle member engaging said detent;

f. detent teeth carried on an outer peripheral surface of said planetary cage;

g. a pawl pivotally carried on said housing and bearing teeth to mesh with the ratchet teeth on said planetary cage; and

h. resilient pawl actuation means carried by said second toggle member whereby movement of said toggle members from said in-line relationship will rock said pawl into engagement with said detent teeth.

3,866,493
AIR-OPERATED HAND TOOL

Chester A. Ringerud, 5537 Dundee Rd., Edina, Minn. 55436

Filed Apr. 1, 1974, Ser. No. 456,457
Int. Cl. B25b *17/00, 21/00, 13/00*
U.S. Cl. 81—57.11 **8 Claims**

1. An air-operated hand tool, which is also capable of manual operation, having a rotary output, said tool comprising:

a. a tool body;

b. means defining a hollow cylinder within said tool body;

c. a piston sealably located in said cylinder and mounted for reciprocal movement in said cylinder, said movement having a power direction and an exhaust direction; said piston having opposed first and second ends and having a longitudinally extending cylindrical bore extending axially through said piston between said first and second ends, said piston being moveable in said cylinder when subjected to air pressure on one end different from the air pressure on the second end;

d. air conduit means for directing pressurized air flow from a source to said cylinder and for venting air from said cylinder to cause movement of said piston;

e. drive shaft having a generally cylindrical outer surface and extending coaxially through said longitudinal bore in said piston, said drive shaft being rotatably moveable;

f. power train means for converting reciprocatory motion of said piston into rotary motion of said drive shaft;

g. tool bit for engaging a work piece;

h. rotatable chuck means carried by said body for holding said tool bit in axial alignment with said drive shaft;

i. power drive clutch means for operatively connecting said drive shaft with said chuck means to permit power rotation of said tool bit; and

j. manual drive clutch means for operatively connecting said tool body with said chuck means to thereby permit the tool bit to be rotated by manual rotation of said tool body.

3,866,494
RING GRIPPING TOOL

George Dotson, Bliss, Idaho, assignor to Dotson and Evans Inc., Bliss, Idaho

Filed Apr. 22, 1974, Ser. No. 462,601
Int. Cl. B25b *13/48*
U.S. Cl. 81—72 **13 Claims**

1. A ring-gripping tool for holding a finger ring in position for polishing comprising

a. a hollow, cylindrical, elongated body member, said body member having an open end at one end and a handle portion at the opposite end,

b. a lip member having a curved ring-contacting outer surface projecting beyond at least a portion of said open end of said hollow body member,

c. a lever member disposed with said hollow body member, one end of said lever member pivotally attached to said hollow body member and a free end of said lever member extending from said open end of said hollow body member, said free end of said lever member being substantially coextensive with the farthest projecting edge of said lip member,

d. a saddle member having a ring-contacting outer surface, said saddle member attached to the free end of said lever member,

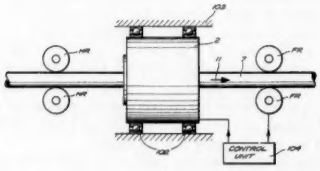
e. an adjustment screw threaded through the sidewall of said hollow body member to contact said lever member to force said free end of said lever member away from said lip member to cause said saddle member to coact with said lip member to hold a finger ring in position for polishing.

3,866,495

METHOD AND APPARATUS FOR SHAVING ELONGATED WORKPIECES

Alfons Goeke, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Aug. 8, 1972, Ser. No. 278,861
Int. Cl. B23b *5/08, 1/00*
U.S. Cl. 82—1 C **11 Claims**



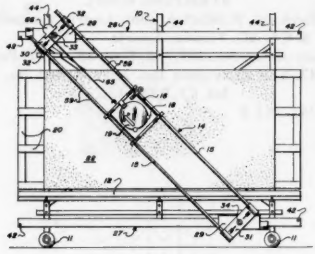
1. A method of shaving the circumferential surfaces of metallic wire, rods, tubes or analogous workpieces of generally circular profile by means of knives which orbit in a predetermined plane about a predetermined axis, comprising the steps of orbiting the knives at a relatively high initial speed and feeding a workpiece lengthwise in the direction of the axis at a starting speed so that the rapidly orbiting knives remove material at the circumferential surface of the moving workpieces at a predetermined cutting speed whose vector is the sum of vectors representing the relatively high initial speed of orbital movement of the knives and the starting speed of lengthwise movement of the workpiece; and gradually reducing said initial speed to a predetermined operating speed while simultaneously gradually increasing the speed of movement of the workpiece from said starting speed, so that the cutting speed remains unchanged during said gradual reduction of the initial speed and at said operating speed.

3,866,496

SHEETBOARD CUTTING MACHINES

Marion L. Payne, 8403 Claremont, N.E., Albuquerque, N. Mex. 87112, and Marion A. Payne, 908 N. Howard, Carlsbad, N. Mex. 87220

Filed Aug. 16, 1973, Ser. No. 388,803
Int. Cl. B23d *45/02;* **B27b** *5/06*
U.S. Cl. 83—471.3 **10 Claims**



1. A sheetboard cutting machine comprising:

a. an upstanding support frame;

b. a horizontal fence mounted frontally to said support frame and adapted to carry said sheetboard thereon edgewise;

c. a saw guide extending upwardly and across the front of said support frame in spaced parallel relation thereto;

d. a saw mounting assembly slidably mounted upon said saw guide;

e. means mounted upon said saw mounting assembly for rotatably carrying the saw, whereby the saw can be selectively angularly rotated with respect to said saw guide;

f. means for movably carrying the saw guide upon the support frame, whereby the saw guide can be moved upon said support frame in a plane parallel thereto, to enable a horizontal cut to be made in the sheetboard without advancement thereof; and

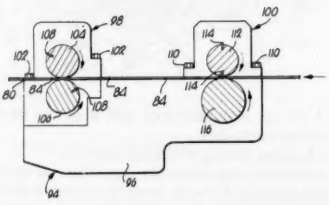
g. means rotatably interconnecting said saw guide carrying means and said saw guide, whereby said saw guide can be rotated in a plane parallel to said support frame.

3,866,497

CROSS-PERFORATING OF CONTINUOUSLY MOVING, SUPERIMPOSED LEAVES

Larry B. Wolfberg, 860 Tara Ln., and John Harper, 8008 Willowbrook, both of Wichita, Kans. 67207

Continuation-in-part of Ser. No. 210,124, Dec. 20, 1971, , which is a continuation of Ser. No. 882,256, Dec. 4, 1969, abandoned. This application Nov. 24, 1972, Ser. No. 309,128
Int. Cl. B26f *1/08*
U.S. Cl. 83—30 **6 Claims**



1. In a method of preparing a cross-perforated, multi-leaved web foldable in opposite directions at preselected perforation fold line intervals for formation of a layered pack having, in

each layer, a plurality of end-to-end articles separated by perforation tear lines, the steps of:

advancing a plurality of leaves in superimposed, aligned relationship with one another along a common path of travel;

presenting the advancing web of leaves to a first perforating station;

producing spaced-apart, perforation fold lines in the advancing leaves at said first station by alternately penetrating the leaves from opposite directions at preselected intervals;

presenting the advancing web of leaves to a second perforating station independent of said first station; and

producing spaced-apart, perforation tear lines in the advancing web of leaves at said second station and at preselected intervals selected to locate at least one perforation tear line between each pair of perforation fold lines.

3,866,498

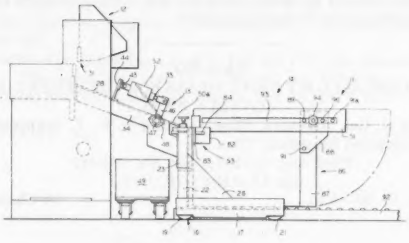
LIGHT DUTY STACKER

David J. Jarman, Box 181, R.R. 3, Aurora, Ind. 47001

Filed July 30, 1973, Ser. No. 383,666

Int. Cl. B65h *29/26, 35/04*

U.S. Cl. 83—89 **6 Claims**



1. A light duty stacking assembly for use in conjunction with shears,

said assembly comprising a conveyor portion for transporting material from the shears,

a stacking portion for use in stacking the transported material,

non-motorized means on said conveyor portion for moving the material from the shear to the stacking portion,

a stacker rail assembly common to both said stacker portion and said conveyor portion,

said stacker rail assebly comprising a pair of support cart frames oppositely disposed from each other,

standards on each of said support frames extending vertically upwardly at the shear end of said support cart frames,

stacker rail means extending between said standards,

means for attaching said conveyor to said rail,

back stop means for stopping the sheared material after it slides from the conveyor,

said back stop means including angle beam means,

side plates for supporting said angle beam means,

means for attaching said side plates to said rail means for supporting said side plates, and

means for enabling said back stop to rotate from a vertical position to a horizontal position.

3,866,499

APPARATUS TO MAKE PILE FABRICS IN WHICH PILE THREADS ARE BONDED TO A BASE LAYER

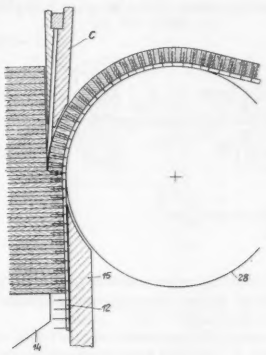
Jakob Messner, Unterschauersberg 66, Wels/Thalheim, Austria

Filed Mar. 24, 1972, Ser. No. 237,854

Claims priority, application Germany, Mar. 27, 1971, 2114859

Int. Cl. B26d *7/06*

U.S. Cl. 83—278 **9 Claims**



1. Apparatus to make pile fabric in which individual pile threads or fibers are joined to a base layer comprising

a needle holding web (**12**) having projecting needles transverse to the web;

means (**15**) guiding the web to the end faces of the threads with the needles projecting towards the end faces of the threads to spear at least some of the threads on the projecting needles;

cutting means (C) severing the threads at a position beyond the insertion depth of the needles;

and thread feed means (A) comprising

a plurality of spaced, stacked, plate-like elements (**2,3**) adapted to hold the thread therebetween essentially in parallel alignment and to have the end faces of the threads exposed at the ends of the plates;

gripping means (**2c, 3c**) located on said plate-like elements and movable between a projecting position in which the threads between the plates are engaged, and a retracted position in which the gripping means are out of contact with the threads;

and means cyclically moving the plate-like elements transverse to the web (**12**) and moving the gripping means to grip the thread when the plate-like elements are moved towards the web to feed a pile of threads, and to retract the gripping means when the plate-like elements are retracted in advance of the next feed movement.

3,866,500

CROSS-PERFORATING OF CONTINUOUSLY MOVING, SUPERIMPOSED LEAVES

Larry B. Wolfberg, and John Harper, both of Wichita, Kans., assignors to Service Business Forms, Inc., Wichita, Kans.

Division of Ser. No. 309,128, Nov. 24, 1972, , which is a continuation-in-part of Ser. No. 210,124, Dec. 20, 1971, , which is a continuation of Ser. No. 882,256, Dec. 4, 1969, abandoned. This application Feb. 15, 1974, Ser. No. 442,861

Int. Cl. B26f *1/20*

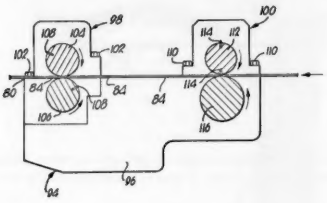
U.S. Cl. 83—300 **6 Claims**

1. Apparatus for preparing a cross-perforated, multi-leaved web foldable in opposite directions at preselected perforation fold line intervals and having at least one perforation tear line

between each pair of said fold lines, said apparatus including: frame means;

means associated with said frame means for advancing the leaves in superimposed, aligned relationship along a common path of travel;

a first perforating head mounted on said frame means for receiving the leaves and producing said fold lines therein, said first head having a pair of opposed rotary members disposed on opposite sides of the web of leaves, each member being provided with at least one elongated, peripherally disposed set of leaf perforating means with the set of perforating means of one member being angularly



offset from that of the other member to thereby produce the fold lines at spaced intervals and alternately from opposite directions; and

a second perforating head mounted on said frame means in spaced relation to said first head for receiving the leaves and producing said tear lines therein,

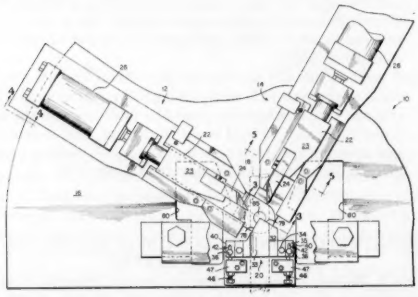
said second head including a rotary member disposed on one side of the web of leaves having at least one elongated, peripherally disposed set of leaf-perforating means which is angularly offset from the perforating means of said first head to produce said tear lines at spaced intervals selected to dispose at least one tear line between each pair of fold lines.

3,866,501

TUBE SHEAR MACHINE

Don M. Glendenning, Dexter, Mo., and Louis Bledstein, Indianapolis, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed Nov. 5, 1973, Ser. No. 412,654
Int. Cl. B23d *21/02*
U.S. Cl. 83—382 **14 Claims**



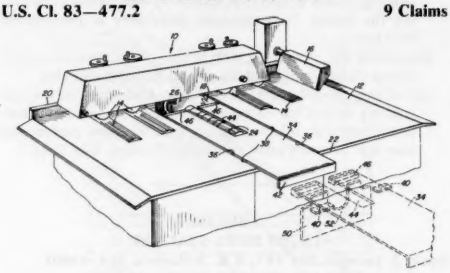
1. A tube shear machine for shearing a length of tubing, comprising a machine table, a die assembly carried on said table for releasably clamping said tubing in position and defining a pair of angularly disposed cutting faces, a pair of cutting blades operatively supported on said table and movable with respect to said die assembly, first means for angularly adjusting the path of movement of said blades with respect to each other and with respect to said die assembly, and second means for moving each of said cutting blades along one of said angulated cutting faces to shear said tubing at a pair of angles.

3,866,502

GANG RIP SAW

Clarence R. Brewer, Sr., P.O. Box 211, Central City, Ky. 42330

Filed Mar. 8, 1974, Ser. No. 449,529
Int. Cl. B23d *45/06, 47/00*
U.S. Cl. 83—477.2 **9 Claims**



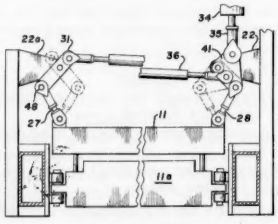
1. In a gang rip saw, a tabletop, a transversely elongated blade accommodating opening through said top, a well below said opening, an elongated blade mounting arbor in said well extending longitudinally of the opening, ganged blades mounted on said arbor and extending through said opening, and adjustable means for varying the length of said opening transversely of the top to adapt the size of the opening to the specific ganged blade arrangement.

3,866,503

RECIPROCATORY DRIVE MEANS FOR TREATMENT OF MOVABLE WEBS

Carl G. Gal, Attleboro, Mass., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Aug. 22, 1973, Ser. No. 390,482
Int. Cl. B26d *5/10, 5/18*
U.S. Cl. 83—626 **20 Claims**



1. Reciprocating driving means for tool means for intermittent treatment of webs of film at a work station and comprising:

a. stationary frame means defining said work station and having means supporting a web of plastic film for movement through said work station;

b. tool means extending generally laterally across said web supporting means and having opposed first and second ends with at least one working head portion operatively secured therebetween, and reciprocatory drive means coupled to said frame means with said reciprocatory drive means having a movable mechanical output member;

c. said stationary frame means including means for normally retaining said tool means in a plane spaced from said web;

d. mechanical linkage means coupling said tool means to said reciprocatory drive means and arranged to drive said working head portions of said tool means into contact with said film; said linkage means including first and

second laterally spaced lever elements disposed generally laterally across said web with said first lever element being coupled to said mechanical output member, and with said second lever element being coupled to said first lever element by a generally transversely extending arm;

e. said first lever element including a pivotally mounted crank means having first and second arms extending outwardly from said pivot mount, with the first arm having at least two points of attachment, each being spaced a finite distance from the plane of said web, and with the first point of attachment being pivotally coupled to said tool means, and with the second point of attachment being pivotally coupled to said transversely extending arm, and with said second arm being pivotally coupled to said mechanical output member;

f. said second lever element including a pivotally mounted lever arm means attached to said frame means, and with one arm of said lever being pivotally coupled to said tool means, and with the second arm of said second lever element being pivotally coupled to said transversely extending arm whereby motion of said mechanical output means in directions toward and away from said web plane are each translated into reciprocatory to-and-fro motion in said tool means.

3,866,504

SAW BLADE

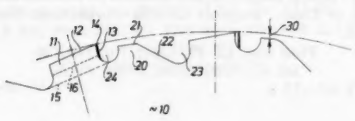
Tore Vilhelm Claesson, and Johan Esbjorn Rojd, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Continuation of Ser. No. 227,810, Feb. 22, 1972, abandoned. This application Jan. 14, 1974, Ser. No. 433,374

Claims priority, application Sweden, Feb. 26, 1971, 2447/71

Int. Cl. B27b *33/02*

U.S. Cl. 83—852 **5 Claims**



1. Saw blade adapted for cutting bush and tree branches, said blade having in combination alternating cutter teeth and depth gauge teeth which are spaced from each other at both ends, in which combination each cutter tooth is made in one piece with the body of the blade and formed by setting and has a substantially radially directed chip surface and a clearance surface formed by the edge of the blade and having a relatively small inclination to the sawing direction of up to 20°, said chip surface and clearance surface forming a cutting edge at their intersection, each depth gauge tooth being located at a short distance in front of the cutting edge and having an upper surface which is substantially parallel to a plane between the outermost points of the cutting teeth on either side of the depth gauge tooth, said cutting teeth being set along their whole length above said blade.

3,866,505

ENSEMBLE EFFECT IMPARTING DEVICE USING A BUCKET BRIGADE DEVICE FOR AN ELECTRIC MUSICAL INSTRUMENT

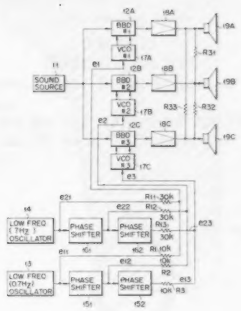
Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed July 18, 1973, Ser. No. 380,360

Claims priority, application Japan, July 20, 1972, 47-72703; Sept. 5, 1972, 47-89006; Sept. 5, 1972, 47-89008; Sept. 5, 1972, 47-89009; Sept. 8, 1972, 47-90161; Sept. 8, 1972, 47-90162; Sept. 8, 1972, 47-104882; Oct. 27, 1972, 47-123499

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **18 Claims**



1. A sound reproducing system for reproducing musical sounds from an electrical musical instrument, comprising:

at least one source of sound signals obtained during performance on at least one electrical musical instrument;

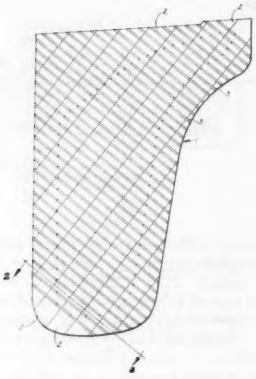
a plurality of bucket brigade devices coupled with said sound signal source to receive said sound signals, each of said bucket brigade devices acting as a signal delay path for the sound signals supplied thereto from said sound signal source;

a plurality of voltage controlled type clock pulse oscillators, each generating a clock pulse signal having a super audible frequency, coupled with a corresponding one of said bucket brigade devices to cause said bucket brigade devices to impart respective time delays to the sound signals supplied thereto from said sound signal source, the imparted time delay being a function of the frequency of the clock pulse signal generated by the associated clock pulse oscillator;

means coupled to said clock pulse oscillators to continuously vary the frequencies of the clock pulse signals generated thereby, said means for varying the frequencies of the clock pulse signals including at least two low frequency signal sources, one of said low frequency signal sources generating a first low frequency signal having a frequency of about 0.5 to 3 Hz, and the other low frequency signal source generating a second low frequency signal having a frequency of about 5 to 12 times that of said first low frequency signal and a voltage level equal to about 1/3 to 1/5 of that of said first low frequency signal; phase shift means for converting at least one of said first and second low frequency signals from said low frequency signal sources into a plurality of signals having different phases; and means coupling said low frequency signals, including said different phase signals, to said clock pulse oscillators to cause each of said bucket brigade devices to impart to the sound signals supplied thereto from said sound source a time delay which continuously varies with the frequency of the clock pulse signal from the corresponding one of said clock pulse oscillators; and means receiving said delayed sound signals

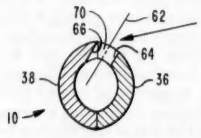
obtained through said bucket brigade devices for generating an audio output responsive thereto.

3,866,506
SOUNDBOARD CONSTRUCTION FOR STRINGED MUSICAL INSTRUMENTS
Harold A. Conklin, Jr., Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Oct. 19, 1973, Ser. No. 407,854
Int. Cl. G10c *3/06*
U.S. Cl. 84—195 **11 Claims**



1. In a musical instrument having a plurality of strings defining the scale of the instrument, a soundboard having a series of spaced apart reinforcing ribs secured thereto, adjacent ribs throughout said series of ribs being spaced apart by a distance between their centerlines which is less than one-half the vibrational wave length of the soundboard at the fundamental scale frequency of the highest note on the scale of the instrument, the numerical ratio between the cross-sectional widths of the ribs and the distance between the centerlines of adjacent ribs being maintained essentially constant irrespective of the number of ribs employed.

3,866,507
NONCIRCULAR HEAD JOINT FOR A CONCERT FLUTE AND METHOD OF MANUFACTURE
Raoul J. Eajardo, P.O. Box 4194, Whittier, Calif. 90605
Filed July 26, 1973, Ser. No. 382,867
Int. Cl. G10d *7/02*
U.S. Cl. 84—384 **12 Claims**



1. A head joint for a concert flute comprising a curvilinear closed wall having a connecting end and a longitudinally spaced closure end, the interior surface of the closed wall defining a cross section in a plane perpendicular to the longitudinal direction which has a gradual, continuous transition from circular at the connecting end to approximately elliptical at the closure end; and an embouchure hole extending through the wall and having a central axis longitudinally disposed nearer the closure end than the connecting end.

3,866,508
STICK FOR PLAYING PERCUSSION INSTRUMENTS
Elmer F. Huslig, 2020 17th St., Great Bend, Kans. 67530
Filed Sept. 21, 1970, Ser. No. 73,943
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 **4 Claims**

1. A drumstick for manually striking percussion type musical instruments comprising:

an elongated, unitary, solid member including a striking bead at one end of the member, an intermediate length of the member adapted to be gripped by a user, a connecting length of the member extending from said intermediate length to said bead, and a terminal length of the member adjacent the end thereof remote from said bead,

said member having a fixed balance point intermediate its ends, the portions of the member between said balance point and the respective opposite ends of the member having equal masses,

said intermediate length being disposed between said balance point and the end of the member remote from said striking bead,

said lengths of the member each having a pair of intersecting, perpendicular, transverse cross-sectional axes,

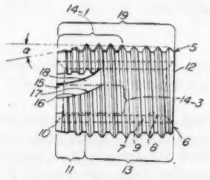
the transverse dimension of the member being greater along one of said axes than along the other of said axes throughout parts of the member including at least said intermediate length thereof,

said parts of the member being provided with a pair of spaced, opposite, generally flattened side surfaces and a pair of spaced, opposite, curved edge surfaces,

said parts of said member extending throughout said intermediate length only,

said terminal and connecting lengths being of generally circular transverse cross section.

3,866,509
SELF-TAPPING AND SELF-RETAINING, SCREW THREAD INSERT
Peter E. Kraus, Ridgefield, and Kenneth C. Newton, Danbury, both of Conn., assignors to Mite Corporation, Danbury, Conn.
Filed Aug. 22, 1973, Ser. No. 390,428
Int. Cl. F16b *25/00, 37/00, 39/30*
U.S. Cl. 85—32 R **7 Claims**



1. A self-tapping and self-retaining, screw thread insert comprising an externally threaded cylindrical body of relatively hard rigid material having at least a hollow leading end portion defined by a tubular wall with external thread turns being interrupted for rotationally cutting a mating female thread into the wall of a receptive hole in a parent body of relatively softer rigid material; said insert body having a leading tip end, a tip end section, a trailing back end and an intervening midsection with the successive external thread turns on the latter being of full crest diameter and those on the tip end

sec ion having the crests thereon taper chamfered progressively to reduce the thread depth toward the tip end; characterized by the provision of

1. a generally longitudinal localized area on at least one exterior side of the tubular wall of said hollow leading end portion from said insert tip end back into said insert midsection beyond portions of at least the first two thread turns of full diameter on the latter and which extends transversely outwardly to a limited degree beyond the remaining corresponding portions of the insert, said area forming a composite camber in which the sections of the external thread turns crossing this localized camber area are humped providing thread turn hump portions projecting radially outwardly beyond adjacent thread turn portions and having smooth transitions on the rotationally leading and trailing sides of said camber area with the adjacent circular portions of these thread turns, the thread turns on said midsection, except for said hump portions, being of uniform crest and root diameters;
2. said localized camber area having a forward zone provided with a generally longitudinal and external thread-interrupting kerf channel extending forward across the external thread turns in this zone from a point rearward of at least the first full diameter turn in said midsection to said tip end without breaking inward through the wall of said sleeve body, whereby the rotationally trailing side of said kerf channel and the severed ends of the external thread turns therein provide cutting edges to form the female thread turns in the parent body receptive hole wall upon thread advancing rotation of said insert body thereinto with at least one uninterrupted full diameter thread turn of said midsection having such a hump portion crossing said camber area to serve with the female threads of said parent body an insert retaining means upon full seating of said insert into the parent body.

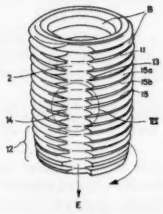
3,866,510
SELF-TAPPING THREADED BUSHINGS

Carl B. H. Eibes, deceased, late of Dr. Carl-Eibes-Str. 11, Schnaittenback, Germany (by Ursula Eibes, nee Waschau); Christian Eibes, Dr. Carl-Eibes-Str. 11, Schnaittenback, Germany; Carl-Herwig Eibes, Grunewaldstra. 30, Berlin-Schoneberg, Germany, and Maria-Theresia Wagner, nee Eibes, Hans Klopferweb Nr. 1, Amberg, Germany (legal heirs)

Continuation of Ser. No. 125,260, March 17, 1971, abandoned, which is a division of Ser. No. 733,562, May 13, 1968, Pat. No. 3,597,781. This application Feb. 5, 1973, Ser. No. 329,952

Int. Cl. F16b *25/00*

U.S. Cl. 85—47 **3 Claims**



1. A threaded self-tapping bushing adapted to be secured to a workpiece and comprising,

an elongate member having helical male threads extending over at least a portion of its axial length said threads having crests, roots between said crests, and flanks extending from said crests to said roots on either side of said crests;

said member having at least one axially extending bevel intersecting a plurality of successive threads,

the crests and flanks of each said male thread at their intersection with said bevel defining frontal areas on either side of said bevel which are concave both along the circumferential direction of each said male thread and transversely thereto along the axial direction of the bushing, each said bevel being approximately as deep as the roots between the crests to ensure that the roots between successive crests are essentially discontinuous at each bevelled portion, each said frontal area providing cutting edges along at least a part of its periphery as defined by said crest, flanks, and bevel,

one of the two said frontal areas formed at the junction of each said male thread with said bevel having a greater curvature than the other.

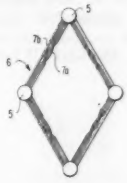
3,866,511
FISHING GILL NET

Sadayoshi Usuda, Osaka, Japan, assignor to Unitika Ltd., Hyogo, Japan

Filed Jan. 2, 1973, Ser. No. 320,335

Int. Cl. A01k *73/12;* **D04g** *1/00*

U.S. Cl. 87—12 **10 Claims**



1. In a fishing gill net made of synthetic fiber yarns, the improvement wherein: at least one of the legs betwen the knots constituting the meshes thereof, consists of two to four mono-filaments, each filament having a size of 30–3000 denier, and wherein said filaments extend in parallel or loosely entangled without twist to form leg meshes between knots when immersed in water and ground meshes between knots for multiple legs.

3,866,512
APPARATUS FOR BRAIDING KNOTLESS NETTING

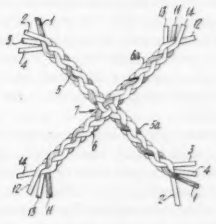
Heinz Berger, Oldenburg, Germany, assignor to August Heroz Maschinenfabrik, Oldenburg, Germany

Continuation-in-part of Ser. No. 77,509, Oct. 2, 1970, Pat. No. 3,714,862. This application Jan. 18, 1973, Ser. No. 324,605

Claims priority, application Germany, Oct. 3, 1969, 1949893

Int. Cl. D04c *3/30*

U.S. Cl. 87—37 **12 Claims**



1. A machine for knotless net braiding, comprising: a generally horizontal braiding assembly having a plurality of braiding

units for braiding yarns into legs with braid-interlaced connections; a braid lifter assembly coordinated with said units, to receive the braided legs therefrom and to complete their braid-interlacing; a plurality of wing wheels in each braiding unit for said braiding; bobbin needles engageable by said wheels for sliding motions along tracks in said assembly; each of said braiding units comprising stationary guide grooves disposed in a plate member through which yarn to be braided passes; a plurality of rotary track switch units, each having a plurality of track switches, generally interposed between such braiding units; each of said track switches having movable grooves which upon shifting of said track switches connect a stationary guide groove of one braiding unit with a stationary guide groove of another braiding unit; and power and control means for the braiding and track switch units, to successively circulate the bobbin needles with the wheels and interchange them therebetween in a predetermined program.

3,866,513

TRANSVERSE SLIDING BREECH BLOCK

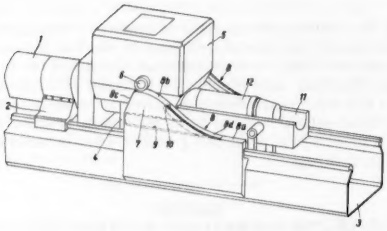
Josef Hornfeck, Dusseldorf, and Rolf Bartolles, Wuppertal-Vohwinkel, both of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Dec. 5, 1968, Ser. No. 785,012

Claims priority, application Germany, Dec. 5, 1967, 1578049

Int. Cl. F41f *11/00*

U.S. Cl. 89—4 B **10 Claims**



1. In a piece of ordnance, the combination which comprises:

a. a barrel having a breech with a breech opening;

b. a breech block for closing said breech opening of said barrel, said breech block being mounted on the exterior of said breech for sliding movement relative to said barrel transversely to the axis of said barrel and in the vertical longitudinal central plane of said barrel;

c. a cradle for mounting said barrel and breech block for forward and rearward movement in the direction of said bore axis; and

d. camming means for raising said breech block and thereby uncovering said breech opening during forward movement of said barrel, said camming means including a pair of lateral cam surfaces mounted on said cradle, one on each side of said barrel, and increasing in height in the forward direction, and a pair of cam follower means mounted on opposite sides of said breech block for movement therewith and coacting with the associated one of said lateral cam surfaces.

3,866,514

SAFETY DEVICE FOR A TANK TURRET WEAPON

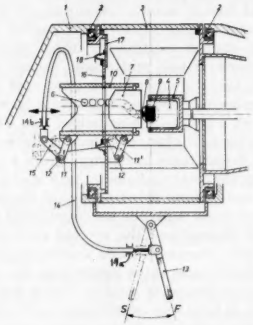
Siegfried Uhl, and August Schiele, both of Augsburg, Germany, assignors to Keller & Knappich Augsburg Zweigneiderlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Augsburg, Germany

Filed Apr. 11, 1973, Ser. No. 350,288

Claims priority, application Germany, May 3, 1972, 2221539

Int. Cl. F41h *7/06*

U.S. Cl. 89—36 K **4 Claims**



1. A safety device for a tank turret weapon placed adjacent to the weapon catch and comprising:

a cartridge feed to supply cartridges to said weapon catch;

a movable support holding said cartridge feed;

said movable support being pivotally mounted on the carriage of said weapon and separately from said weapon; and

pivot operating means (for moving said movable support and said cartridge feed in single movements toward and away from said weapon) having an arm extending from and placed within the tank turret, a plurality of levers pivotably coupling said movable support to said arm, and means for rotating at least one of said levers so that said cartridge feed is alternatively located in two positions, a first position removed from said weapon catch providing for a safety mode, and a second position adjacent to said weapon catch providing for a firing mode.

3,866,515

ADJUSTABLE ROTARY SENSORS FOR A SELF-RESTORING FLUIDIC MORTAR SUPPORT SYSTEM

William H. Ziegler, Waterford, and Gary W. Woods, Ballston Lake, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 15, 1973, Ser. No. 406,404

Int. Cl. F41f *1/06, 21/08*

U.S. Cl. 89—37 C **11 Claims**

1. In an adjustable tripod support for the firing tube of a mortar having a fluidic control system for automatically restoring the tube to a previously selected sighting inclination in response to the recoil displacement encountered during the firing thereof, the combination of,

a primary leg having a yoke in pivotal supporting engagement with the firing tube,

a pair of secondary legs pivotally engageable with said primary leg for supporting the firing tube at the selected sighting inclination,

a first piston having an elongated rod extending therefrom into fixed engagement with said yoke and slidably dis-

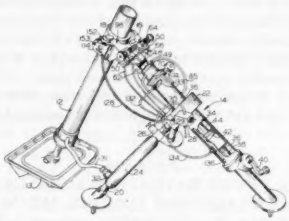
posed in said primary leg for imparting elevational movement to the firing tube,

a second piston slidably disposed in said yoke for imparting azimuth movement to the firing tube,

first sensing means disposed in said yoke and responsive to the elevational component of the recoil displacement of the firing tube for activating the fluidic control system to actuate said first piston until the firing tube is restored to the initial sighting inclination thereof, said first sensing means comprising,

a control shaft rotatably disposed in said yoke with one end fixed to the firing tube and the opposite end thereof having a separately rotatable segment thereon, said shaft and said segment each having a transverse chordal surface disposed in adjacent relation and extending in opposite directions to form an angle therebetween,

a cylindrical bushing rotatably disposed in said yoke in surrounding relation to said chordal surfaces, said



bushing having a pair of sensing orifices through opposite sides thereof in coaxial relation and in respective alignment with said chordal surfaces, and

means for releasably locking said rotatable segment to said control shaft with the remote edges of said chordal surfaces selectively positioned relative to said sensing orifices to establish a desired deadband zone through which said control shaft must be rotated prior to unblocking one of said orifices for activating the fluidic control system to actuate said first piston,

second sensing means disposed in said primary leg in surrounding relation to said primary leg and responsive to the azimuth component of the recoil displacement of the firing tube for activating the fluidic control system to actuate said second piston until the firing tube is restored to the initial sighting inclination thereof, and

means for adjusting said first and second sensing means to delay activation of the fluidic control system until the recoil exceeds a predetermined degree of movement in azimuth and elevation, respectively.

3,866,516

SEMI-AUTOMATIC PISTON EMPLOYING A PIVOTALLY, SLIDEABLE MEMBER

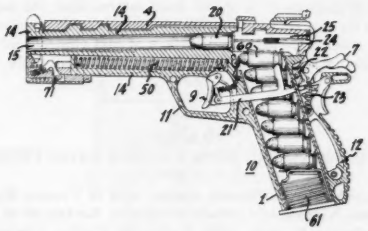
David M. Frisoli, 2 Homestead Rd., Edison, N.J. 08817

Filed July 30, 1973, Ser. No. 383,592

Int. Cl. F41d *3/06, 11/12*

U.S. Cl. 89—190 **10 Claims**

1. A firearm for firing projectiles, comprising a slide member moveable from a first position to a second position, a barrel assembly integrally formed with a frame assembly, means coupling said barrel to said slide to cause said slide to first pivot upward away from said barrel during recoil when moving from said first to said second position and while said



projectile is still in the barrel and furthest away from the muzzle end of said barrel.

3,866,517

ROTOR CENTERING ARRANGEMENT FOR A HYDRAULIC MACHINE

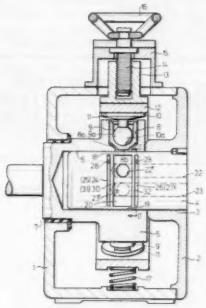
Ulrich Aldinger, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 13, 1972, Ser. No. 305,955

Claims priority, application Germany, Dec. 10, 1971, 46528

Int. Cl. F01b *13/06*

U.S. Cl. 91—484 **10 Claims**



1. A rotor centering arrangement for a hydraulic machine, comprising, in combination, a rotor having a set of circumferentially spaced working chambers for a fluid, and an inner circumferential surface having a set of chamber ports communicating with respective ones of said working chambers and moving during rotation along a circular path; and a stationary control body having an outer circumferential surface in sliding contact with said inner circumferential surface of said rotor, and being provided in said outer circumferential surface with a pair of diametrically oppositely disposed part-circular control ports located along said path, said control body having high and low pressure conduits opening into respective ones of said control ports, so that during rotation of said rotor low pressure and high pressure fluid alternately enter said working chambers, said control body having first and second pairs of diametrically oppositely disposed part-circular grooves, said first and second pairs of grooves being located on opposite axial sides of said control ports spaced axially from the latter so that leakage fluid from said control ports flowing through the radial clearance between said outer and inner circumferential surfaces fills said first and second pairs of grooves, said control body being further formed with a first duct and a second duct both penetrating through the material of said control body and each having two open ends, the open ends of said first duct communicating with respective ones of said

first pair of grooves, and the open ends of said second duct communicating with respective ones of said second pair of grooves, whereby to equalize the pressure in the first pair of grooves and whereby to equalize the pressure in the second pair of grooves, each of said ducts intermediate the two open ends thereof being in its entirety located radially inwardly of said outer circumferential surface of said control body completely enclosed by the material of said control body.--

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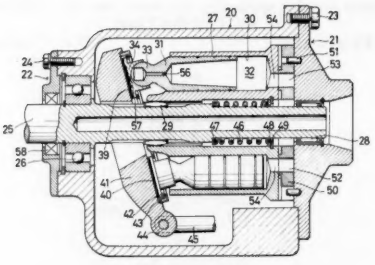
3,866,518

FLUID PRESSURE DEVICE OF THE AXIAL PLUNGER TYPE

Takayuki Miyao; Hiroaki Maeda, both of Toyota; Masanori Sato, Nagoya, and Hiroshi Motoyama, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Dec. 27, 1972, Ser. No. 319,031
Claims priority, application Japan, Dec. 27, 1971, 46-3539
Int. Cl. F01b *13/04*
U.S. Cl. 91—488 **6 Claims**



1. A fluid pressure device of the axial plunger type comprising:

a housing;

a rotatable shaft within said housing;

a rotatable cylinder block operatively connected to said shaft and provided with a plurality of longitudinal cylindrical bores therein;

plungers slidably mounted, respectively, within said bores and including spherical outer end portions;

a valve plate located in abutment with an end surface of said cylinder block and having a pair of ports which communicate successively with said bores as said cylinder block rotates;

a swash plate pivotally supported upon said housing and having a slidable planar surface; and

a plurality of plunger shoes associated with said spherical outer end portions of said plungers at spherical socket portions thereof and including slidable bearing surfaces adapted for engaging said slidable planar surface of said swash plate for causing said plungers to reciprocate,

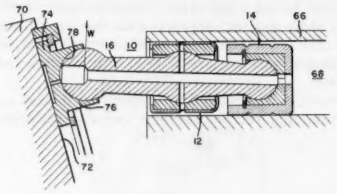
said shoes being formed of a light weight high tensile metal material and said slidable bearing surfaces of said shoes being formed of a high load-bearing alloy, wherein said high-load bearing alloy is applied to said slidable bearing surfaces of said shoe as a powder metallurgy material.

3,866,519

PISTON OF PISTON TYPE FLUID PUMP MOTOR

Takayaki Miyao; Hiroaki Maeda, both of Toyota, and Masanori Sato, Nagoya, all of Japan, assignors to Aisin Seiki Co., Ltd., Kariya-shi, Aichi-ken, Japan

Filed Jan. 16, 1973, Ser. No. 324,128
Claims priority, application Japan, Feb. 18, 1972, 47-17330; Jan. 27, 1972, 47-10106
Int. Cl. F01b *13/04*
U.S. Cl. 91—488 **13 Claims**



1. A piston used in a piston type fluid pump motor which comprises at least two piston heads fitted in a cylinder barrel having coaxially aligned portions, each of said piston heads being rotatably jointed by a ball-and-socket joint to a rod which is movably connected to a swash plate,

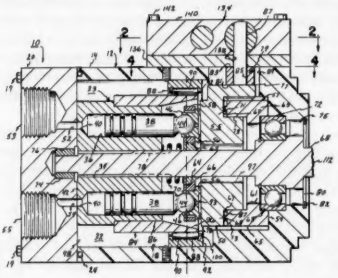
whereby a torque generated on said swash plate is transmitted to said cylinder through said piston heads.

3,866,520

FLUID DEVICE HAVING INTERCHANGEABLE DISPLACEMENT CONTROL MEANS

Wilfred S. Bobier, Bloomfield, Mich., assignor to The Oilgear Company, Milwaukee, Wis.

Division of Ser. No. 181,663, Sept. 20, 1971, Pat. No. 3,806,280, which is a continuation-in-part of Ser. No. 60,333, Aug. 3, 1970,. This application Oct. 26, 1973, Ser. No. 410,274
Int. Cl. F01b *13/04*; **F04b** *49/00*
U.S. Cl. 91—506 **3 Claims**



1. A fluid pressure energy translating device of the axial piston type comprising:

a housing;

a shaft rotatably mounted in said housing;

a cylinder barrel carried by said shaft and rotatable therewith, said cylinder barrel having a plurality of arcuately spaced cylinder bores and cylinder ports communicating said cylinder bores with one end of said cylinder barrel; a plurality of pistons with inner ends disposed for reciprocal stroking movement within said cylinder bores;

a valve face having arcuate openings disposed for relative rotary movement with respect to said one end of said cylinder barrel, with said cylinder ports communicating successively with said arcuate openings as said shaft rotates said cylinder barrel;

a thrust plate pivotably mounted in said housing in a driving relationship with the outer end of said pistons for imparting said reciprocal stroking movement to said pistons within said cylinder barrel bores, the amount of reciprocal movement of said pistons being a function of the degree of inclination of said thrust plate with respect to the axis of rotation of said cylinder barrel;

a displacement varying mechanism comprising:

a second housing releasably attached to said first housing and having a bore with a pressure responsive member slidably mounted therein;

coupling means connecting said pressure responsive member to said thrust plate;

spool means mounted in said housing and movable between positions which selectively communicate pressure fluid to one or the other of the opposite sides of said slidably mounted pressure responsive member so as to change the position of said pressure responsive member, said pressure responsive member being connected to said coupling means so as to move said coupling means as said pressure responsive member moves in response to said pressure to thereby vary the inclination of said thrust plate with respect to the axis of rotation of said cylinder barrel;

means applying a selected force to said spool means to shift said spool means in one direction;

feedback means carried by said pressure responsive member and coupled to said spool means to move said spool means in a direction opposite from said first mentioned direction;

said pivotably mounted thrust plate further comprising a piston engaging face on one end thereof, said thrust plate adapted to be pivoted about a predetermined axis, said thrust plate having an arm member disposed along an axis which extends toward the other end of said thrust plate; a U-shaped member, the legs of which encompass a portion of said arm member, said U-shaped member being reciprocable along a portion of said arm member as said arm member moves through an arcuate path to pivot said thrust plate about said predetermined axis; and a coupling pin movable along a linear path and having one end carried by said U-shaped member, said coupling pin being disposed along an axis which is perpendicular to the path of reciprocal movement of said U-shaped member, the other end of said coupling pin being attachable to said pressure responsive member, the movement of which imparts a linear motion to said coupling pin such that said U-shaped member is simultaneously moved along said reciprocal and linear paths for pivoting said thrust plate about said predetermined axis.

3,866,521

CONTROL DEVICE

Ernesto Juan Weber, No. 470 State of the Federal District, Lluvia, N. Mex.

Division of Ser. No. 236,732, March 21, 1972, Pat. No. 3,786,212, which is a continuation-in-part of Ser. No. 154,536, June 18, 1971, abandoned. This application Jan. 11, 1974, Ser. No. 432,460

Int. Cl. F01b *19/00, 31/00;* **F16j** *3/00*

U.S. Cl. 92—95 **2 Claims**

1. A control device comprising:

a. a housing;

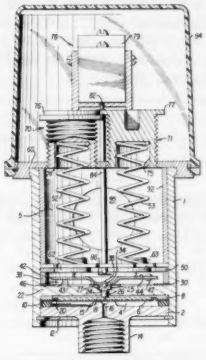
b. a chamber in said housing;

c. a displaceable sensing means defining a wall of said chamber;

d. first and second compressible coil springs disposed in said housing and operatively connected to said sensing means, whereby displacement of said sensing means flexes said springs;

e. a first guide means one end of which is connected with said first spring, the other end of said first guide means being connected to said housing at a first connection point;

f. a second guide means, one end of which is connected with said second spring, the other end of said second guide means being connected to said housing at a second connection point;



g. said first connection point being located in said housing remotely from said first spring and adjacent to said second spring, said second connection point being located in said housing remotely from said second spring and adjacent to said first spring, whereby arcuate movement of said guide means during flexing of said springs is minimized.

3,866,522

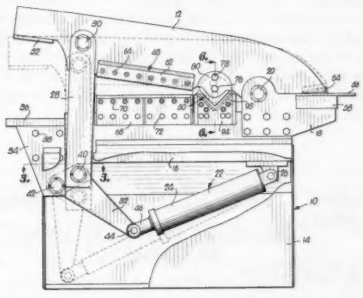
METAL WORKING MACHINE

Harry L. Oswalt, Jr., 615 Briar Hill, Garden City, Kans. 67847

Filed July 27, 1973, Ser. No. 383,092

Int. Cl. B21d *43/28*

U.S. Cl. 72—324 **8 Claims**



1. In a machine for fabricating workpieces:

a horizontally extending bed;

an elongated, generally horizontally extending beam disposed above said bed;

pivot means supporting the beam for swinging movement toward and away from the bed about an axis disposed transversely of the beam,

said beam and said bed having opposed sets of mutually cooperable tool means spaced therealong with certain sets disposed further from said axis than others;

power means disposed below said bed and including a reciprocable member having a stroke of predetermined length;

upright linkage depending from said beam to a position

below said bed and spaced laterally from said pivot means; and

a swingable crank intercoupling said member and the lower end of the linkage for swinging the beam about said axis during actuation of said power means,

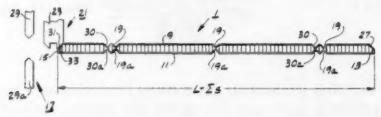
said crank disposing said linkage for movement of the linkage through a displacement substantially less than said stroke of the member whereby to multiply the force applied by said power means to the beam during actuation of the power means.

3,866,523

METHOD AND APPARATUS FOR FORMING BULK CONTAINERS FROM ARTICULATABLE COMPOSITE PANELS

Robert C. Geschwender, Lincoln, Nebr., assignor to Lancaster Research and Development Corporation, Lincoln, Nebr.

Filed May 30, 1973, Ser. No. 365,115
Int. Cl. B31f *1/00*
U.S. Cl. 93—58 ST **25 Claims**



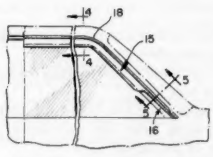
1. Apparatus for forming a panel of stiff but compressible material at least about one-half inch in thickness with scores in both faces thereof spaced at predetermined intervals along the length of the panel so that the panel may be articulated at said scores, said panel comprising a core with facing material adhered to opposite faces of the core having substantial resistance to bending on any axis thereof; said apparatus comprising means at a scoring station operable between open and closed positions for forming a pair of scores extending transversely of the panel, one in each face of the panel, with the two scores substantially in registry, means operable intermittently to feed the panel lengthwise in a predetermined path in the plane of the panel through the scoring means at the scoring station with said scoring means open in increments corresponding to the desired spacing of the scores with a dwell between successive feeding operations, and means for closing said scoring means to form said pair of scores and then opening it during each dwell, the formation of the two scores during each dwell causing a drawing in of the panel on opposite sides of the scoring station, and said feeding means permitting said drawing in.

3,866,524

VEHICLE WINDOW VENTILATOR

Hampton E. Forbes, Jr., 2013 Oak St., Wilmington, Del. 19808

Filed May 11, 1973, Ser. No. 359,455
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.13 **5 Claims**



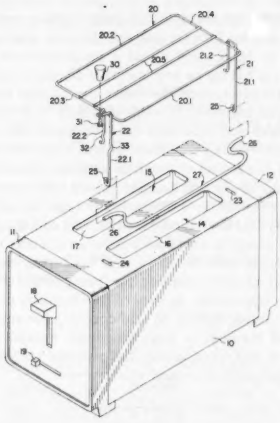
1. In a ventilating apparatus for a vehicle, the combination of a window opening formed in the side wall and a part of the roof area of said vehicle said window opening having a generally horizontally disposed top portion and a rearwardly inclined front portion, a ventless window member of substantially the same shape and size as said window opening, and means for selectively changing the vertical position of said window member within said window opening, the improvement comprising a flange extension for said window opening and located on the inside of said window opening for sealing the window member within said window opening, said flange extension having a primary width along the top portion and the upper part of the rearwardly inclined front portion thereof which reduces the apparent size of said window opening and a secondary width of a smaller dimension than said primary width along the lower part of the rearwardly inclined front portion there, which secondary width provides a ventilating slot at the lower front edge of said window opening when the window is partially lowered within said window opening while the top portion and the upper part of the rearwardly inclined front portion of said flange extension still overlaps and seals the window within the window opening.

3,866,525

TOASTER WITH WARMING RACK

Berton R. Oxel, Louisville, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Mar. 1, 1973, Ser. No. 337,096
Int. Cl. A47j *37/08*
U.S. Cl. 99—357 **6 Claims**



1. In apparatus for toasting bread slices and the like having a housing enclosing a toasting chamber and an upwardly directed, elongated housing opening through which a bread slice may be inserted into and removed from said toasting chamber, the improvement comprising

a rack disposed above said housing and vertically movable relative thereto between at least two vertically spaced positions and providing a selectively usable support for an article to be warmed by heat generated within said toasting chamber, said rack having an opening therethrough in registry with said housing elongated opening and providing for unobstructed passage of a bread slice to and from said toasting chamber,

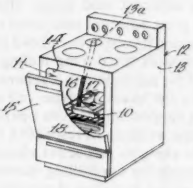
a pair of legs structurally integral with and depending from said rack and said legs being disposed adjacent respective ends of said housing elongated opening and projecting into said housing,

and means within said housing connecting the lower portions of said legs together for simultaneous vertical movement to prevent tilting of said rack in a direction from end to end of said elongated housing opening during movement of said rack between said positions.

3,866,526
BARBECUE PAN STRUCTURE

Yat L. Eng, 237 Linden, Elmhurst, Ill. 60126

Filed Jan. 14, 1974, Ser. No. 433,088
Int. Cl. A47j *37/04*
U.S. Cl. 99—357 15 Claims

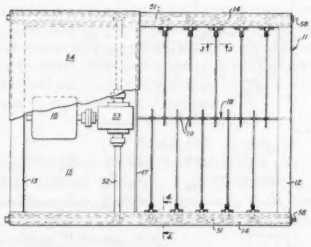


1. A barbecue pan structure for use in barbecueing meat in an oven chamber, comprising:
- a pan adapted to hold a body of water subjacent the meat in the oven chamber;
- closure means substantially covering the body of water and defining an upper surface;
- means for passing through said closure means liquefied drippings falling from the meat onto said upper surface; and
- a flow passage duct for conducting steam evolved from said body of water from below said closure means away from said pan to a point exteriorly of said oven chamber thereby to vent such steam from said oven chamber.

3,866,527
ROTISSERIE

Thomas C. Katris, 8225 Kraay St., Munster, Ind. 46321

Filed Apr. 25, 1973, Ser. No. 354,353
Int. Cl. A47j *37/04*
U.S. Cl. 99—421 H 9 Claims

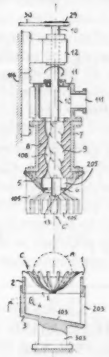


1. A rotisserie structure mountable upon a conventional broiler and adapted to span the broiler from side-to-side thereof and comprising a pair of hollow frame sides arranged in parallel laterally spaced relation and adapted to rest on opposite sides of a broiler and to extend longitudinally of such broiler sides, each hollow frame side having an interior and exterior vertical wall and said walls provided at regular intervals along the frame side with aligned pairs of openings formed therethrough, a driving screw shaft journaled for rotation in the upper portion of each hollow frame side above said pairs of openings at right angles to the axes of the openings, power drive means coupled with said screw shafts to turn them in unison on their axes, drive cups mounted on each hollow frame side and having end portions journaled for rotation in said aligned pairs of openings of the frame sides, said cups having driving socket recesses opening through their interior ends and facing toward the remote hollow frame side of the structure, gears on the drive cups and meshing with said screw shafts within the hollow frame sides whereby said cups are turned in unison, spit driving shafts detachably coupled with said driving socket recesses of the cups, spits coupled with said spit driving shafts and extending axially inwardly thereof transversely of said hollow frame sides and having inner ends terminating substantially midway between the frame sides and near the lateral center of the broiler on which said structure is mountable, support means for the inner ends of the spits near the lateral center of the rotisserie structure, and a pivotal support element for each spit driving shaft secured to the adjacent hollow frame side of the structure and slidably receiving the spit driving shaft and being swingable therewith in a vertical plane to an elevated non-use position with the associated spit, said spit driving shaft then separating from said driving socket recess of its associated cup.

3,866,528
APPARATUS FOR EXTRACTING JUICE FROM CITRUS FRUIT

Nevio Montagroni, 4, Via G. Organi, Forli, Italy (47100)

Filed Jan. 22, 1973, Ser. No. 325,252
Claims priority, application Italy, Feb. 12, 1972, 12003/72; Feb. 12, 1972, 12004/72
Int. Cl. A23n *1/02*; A47j *19/02*; B30b *9/02*
U.S. Cl. 99—495 4 Claims



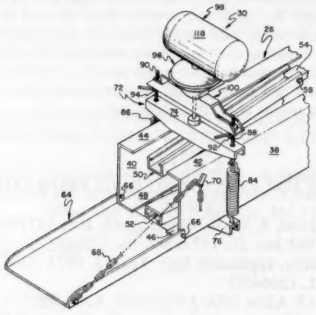
1. A device for processing whole citrus fruit comprising:
- an upper cup arranged with its axis vertical and having a bowl-like cavity directed downwardly;
- a lower cup coaxial with said upper cup and having a bowl-like cavity directed upwardly;
- each of said bowl-like cavities having a multiplicity of narrow ribs separated by correspondingly narrow slots, the ribs of each cup being aligned with the slots of the opposite cup;
- a tubular cutting edge;
- rotary rupturing means arranged within said tubular cutting edge and capable of extending a substantial length into the cavity of the said stationary upper cup;
- suction means being provided to exert suction within said tubular cutting edge;
- for moving the lower cup towards and away from said upper cup, said tubular cutting edge being arranged at the center of the upper cup so that upon upward movement of said lower cup said cutting edge makes a neat incision in the peel of said citrus fruit and establishes a tight seal connection between the interior of the fruit and the suction means.

3,866,529

DENSITY CONTROL FOR HAY BALERS

Owen F. Holman, P.O. Box 993, Corpus Christi, Tex. 77703

Filed Aug. 14, 1972, Ser. No. 280,173
Int. Cl. B65b *13/18*; **B30b** *1/00*
U.S. Cl. 100—43 **9 Claims**



1. A hay baling machine comprising

a chute having a stationary frame and at least one wall mounted adjacent one end thereof on the frame for simple pivotal movement relative thereto for adjusting the density of hay material passing through the chute;

a mechanically driven plunger for forcing hay into one end of the chute; and

means, independent of the mechanically driven plunger, for automatically adjusting the position of the movable wall wholly in response to the compaction of material in the chute for maintaining the density of the bales relatively uniform, the adjusting means comprising

a fluid motor drivably connected to the movable wall;

a source of relatively constant gaseous pressure;

means placing the source in constant communication with the fluid motor during baling operations;

means for filling the pressure source including a conduit having an end open to the atmosphere and a valve in the conduit for holding pressure in the source; and

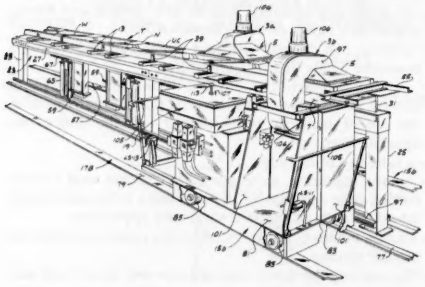
a pressure gauge in communication with the source.

3,866,530

APPARATUS FOR FABRICATING WOOD STRUCTURES

Walter G. Moehlenpah, 9906 Old Warson Rd., Ladue, Mo. 63124

Filed Jan. 4, 1973, Ser. No. 320,900
Int. Cl. B30b *15/16*
U.S. Cl. 100—53 **34 Claims**



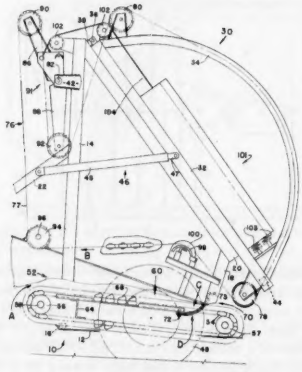
1. Apparatus for fabricating wood structures, such as trusses of the type having lower chord members, upper chord members and web members extending from the lower chord members to the upper chord members, said apparatus comprising two presses each having an upper and a lower platen which are relatively movable toward and away from one another for driving nailing plates into two or more of the wood members of a truss from above and below, means for supporting the wood members which are to be joined together by said nailing plates, said supporting means including a plurality of supports and means cantilevered relative to each support for holding wood members with clearance therebelow, means mounting one of the presses adjacent said upper chord and means mounting the other press adjacent said lower chord for movement of each press along its respective chord into an operating position at a first support for driving nailing plates into the wood members, and for movement in a generally lateral direction with respect to the press sidewise out of its operating position at said first support and into its operating position at a next successive support along its respective chord, each said press being movable along its respective chord independently of the other, and means for controlling movement of each of the press mounting means including means movable therewith for sensing the approach of said press to its operating position at a support in advance of its arrival at its operating position thereby to initiate deceleration of said mounting means and for sensing the arrival of the press at its operating position at the last-said support so as to stop movement of the press at its operating position for driving nailing plates into the wood members.

3,866,531

APPARATUS FOR CONTROLLING THE MOVEMENT OF CROP MATERIAL IN A ROLL FORMING MACHINE

Robert R. Todd, Leola, and Willis R. Campbell, Ephrata, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Oct. 12, 1973, Ser. No. 405,978
Int. Cl. B30b *5/06*; **A01d** *39/00*
U.S. Cl. 100—88 **8 Claims**

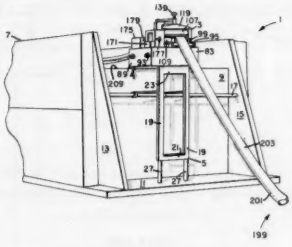


8. An improved hay roll forming machine having a wheeled frame, a floor mounted to the frame adapted to receive a swath of crop material, means associated with the floor for conveying the material to the rear of said floor, an upper apron assembly mounted to said frame above the conveying means and moveable in a direction opposite to the direction of said conveying means, wherein the improvement comprises, means operably associated with said floor to compress said material and to direct said material into contact with said upper apron.

3,866,532
FIREHOSE RETRACTOR

Grant M. Ogden, Jr., Elnora, N.Y., assignor of a part interest to Gloria F. Ogden, Elnora, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,673
Int. Cl. B30b *3/04*
U.S. Cl. 100—171 **10 Claims**



1. A firehose retractor for retracting firehose for storage by flattening and removing trapped water and air from coupled-together, collapsible, pressure-type firehose, laid-out on the ground sepentine-fashion or otherwise, without dragging said coupled-together firehose on the ground, fraying or otherwise damaging said firehose; said firehose retractor comprising means for pivotal mounting of said firehose retractor, said firehose retractor comprising retractor rollers, guide rollers and drive means for transmitting drive to at least one of said retractor rollers, said drive means having in its drive train a torque-responsive clutch; said retractor rollers feeding therebetween said firehose and removing trapped water and air from said firehose, said guide rollers guiding said firehose to said retractor rollers, said guide rollers and said firehose-retractor, pivotal mounting means cooperating to automatically face said retractor rollers in the correct and proper direction of feed for said firehose to said retractor rollers regardless of the lie of said coupled-together firehose on the ground, and said torque-responsive clutch permitting retractor roller drive slippage to inclusively prevent said coupled-together firehose from being dragged on the ground, to prevent said firehose from being frayed and to prevent said firehose from being otherwise damaged.

3,866,533
ELECTRICAL PRINT IMPRESSION CONTROL

Richard L. Gilbert, Endicott; John G. Hamilton, Vestal, and Tatsuo Hasegawa, Endwell; Charles O. Ross, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

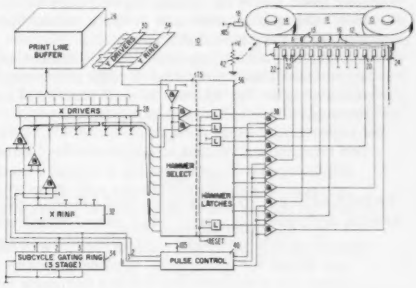
Filed Dec. 26, 1972, Ser. No. 318,309
Int. Cl. B41j *5/09*
U.S. Cl. 101—93 C **8 Claims**

1. In a control system for a printer having a type carrier bearing a plurality of type characters and movable along a print line past a plurality of print positions for impacting one or more forms having a different thickness to print thereon,

a plurality of print hammers aligned with said print positions each having unsaturated electromagnetic actuating means to impart print energy to said hammers, said electromagnetic actuating means being selectively operable in response to electrical pulses applied thereto from a source of electrical energy to actuate said print hammers to impact said forms and type characters, said print energy varying with changes in the voltage of said source and the width of said pulses,

circuit means connected to effect selective energization of said print hammer electromagnetic actuating means from said source of electrical energy in accordance with the presence of particular type characters at each of said print positions, and

control means including means responsive to at least one of the variable operating conditions comprising variation of the voltage of the source and variation in forms thickness which affect the print hammer impact force connected to said circuit means and to said print hammer electromagnetic actuating means to selectively apply energizing

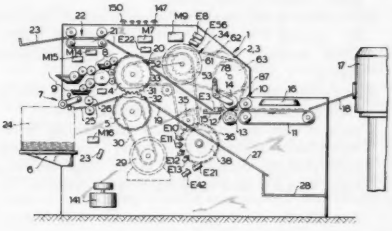


pulses of variable width and hence duration to said print hammer electromagnetic actuating means in accordance with said variable operating conditions to correct for changes in print impact force caused by said variable operating conditions so as to provide a substantially constant print hammer print impact force.

3,866,534
AUTOMATIC PRINTING MACHINE

Heinz Joachim Schinke, Unterkirnach, and Hans-Dieter Uhing, St. Georgen, both of Germany, assignors to Firma Mathias Bauerle GmbH, St. Georgen, Germany

Continuation of Ser. No. 42,936, June 3, 1970, abandoned.
This application June 7, 1973, Ser. No. 367,746
Claims priority, application Germany, Jan. 28, 1970, 2003590
Int. Cl. B41f *7/02*
U.S. Cl. 101—144 **2 Claims**



1. In an automatic printing machine comprising:

a master-feed station adapted to receive a succession of zinc oxide masters;

abutment means at said master-feed station for temporarily retaining each of said masters at said station;

a pair of transport rollers adjacent said master-feed station for engagement with a master upon release thereof by said abutment means;

a continuously driven film cylinder spaced from said transport rollers and provided with means engageable with a master for wrapping same around and releaseably retaining the master on said cylinder;

first guide means forming a transport path between said transport rollers and said cylinder for delivering a master advanced by said transport rollers to said cylinder for engagement therewith;

pressure means juxtaposed with said cylinder and synchronously coupled therewith for pressing a copy sheet against a master wrapped around said cylinder to transfer copy from the master on said cylinder to said sheet;

copy-sheet feed means for delivering a succession of copy sheets between said master wrapped around said cylinder and said pressure means;

second guide means for conducting said copy sheets away from said cylinder and said pressure means upon the transfer of copy to said sheets; and

a presettable counter responsive to the number of copy sheets conducted along said second guide means for terminating further advance of copy sheets and ejecting the master wrapped around said cylinder;

the improvement which comprises:

first rotatable cam means at said master-feed station for displacing said abutment means to release a master for engagement and displacement by said transport rollers and for shifting one of said transport rollers to engage a released master between them;

means coupling one of said transport rollers with said first cam means for synchronous rotation therewith to advance said released master on said first guide means;

a single-revolution clutch operatively connected to said first cam means for rotating said first cam means synchronously with said clutch upon actuation thereof;

means operatively connecting said single-revolution clutch with said cylinder for synchronous rotation of said cylinder and said single-revolution clutch upon actuation thereof;

feeler switch means on said abutment means and displaceable therewith out of the path of a released master, said feeler switch means being positioned to sense the presence of a master at said station;

means operatively connecting said feeler switch means and said single-revolution clutch for actuating same upon the sensing of the presence of a master at said station by said feeler switch means;

second cam means rotatably connected to said single-revolution clutch;

a first cam-operated switch cooperating with said second cam means and operatively connected to said means engageable with said master for enabling the entrainment of the released master displaced along said first guide means by said cylinder;

hydrophilizing means along the periphery of said cylinder for treating a master wrapped thereon to render the same wettable for subsequent image-differentiated inking;

inking means along said drum for applying ink to a hydrophilized master wrapped therearound; and

a second cam-operated switch cooperating with said second cam means and operatively connected with said hydrophilizing means for bringing same into engagement with a master wrapped on said cylinder.

3,866,535

FLUIDIC FREE FLIGHT SENSOR

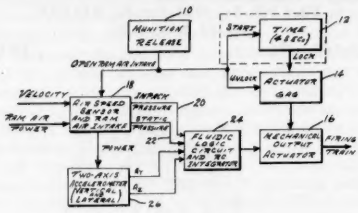
James O. Hedeen, and Harvey D. Ogren, both of St. Paul, Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 17, 1974, Ser. No. 434,155

Int. Cl. F42c *15/12, 11/04*

U.S. Cl. 102—70.2 G **3 Claims**

1. A fluidic free flight sensor for air dropped munition fuses comprising: means for allowing ram air to enter the sensor; means for allowing static air to enter the sensor; means connected to said ram air means and said static air means for determining a differential pressure; and acitvating means connected to the differential pressure determining means; a two axis accelerometer means connected to the activating means, and a mechanical actuator means connected to the activating means output to cause the said mechanical actuator



to function when preset conditions are met in the differential pressure determining means and the accelerometer means.

3,866,536

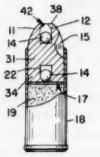
CONTROLLED EXPANSION PROJECTILE

Albert J. Greenberg, 123 North St., Andover, Mass. 01810

Continuation-in-part of Ser. No. 88,741, Nov. 12, 1970, abandoned. This application Apr. 13, 1973, Ser. No. 350,932

Int. Cl. F42b *11/10*

U.S. Cl. 102—91 **15 Claims**



1. An expansion projectile comprising:

a bullet shaped body of relatively soft material having an exposed, unjacketed, soft nose and a base end;

said body having an axial bore, of predetermined longitudinal and lateral dimensions, extending from an opening in said soft nose toward said base end:

a flat tip on said soft nose;

a pellet of relatively hard material, wholly within said bore, said pellet being nearly equal in lateral dimension to said bore and freely movable therein, and of less length than said bore, to form a pellet receiving space extending toward said nose end from said pellet;

and pellet retaining means comprising an inwardly projecting, soft, annular rim of substantially reduced lateral dimensions relative to said bore and extending around said opening for preventing fall-out of said hard pellet while permitting free axial movement thereof along said bore,

whereby said hard metal pellet is captive within but freely movable along said bore, said body collapses inwardly into said space upon impact of the flat tip of said soft nose and said soft nose flattens against said hard metal pellet as said pellet mushrooms said soft nose material.

3,866,537

TRANSFER MECHANISM

Joachim P. C. Minkwitz, Leaf River, Ill., assignor to Rockford Automation, Inc., Rockford, Ill.

Filed Feb. 13, 1974, Ser. No. 442,235

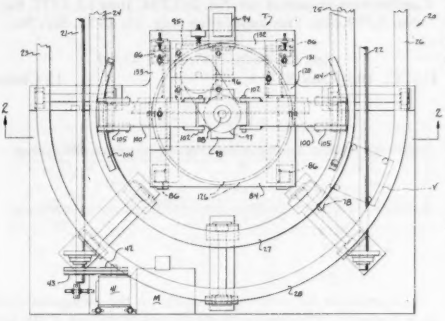
Int. Cl. B61b *13/00*

U.S. Cl. 104—99 **15 Claims**

1. A transfer mechanism for use in a conveyor system which includes a frame; first and second rotary drive shafts mounted on the frame in spaced relation to each other; means for

rotating the rotary drive shafts; a first pair of tracks mounted parallel to the first rotary drive shaft; a second pair of tracks mounted parallel to the second rotary drive shaft; a pair of concentric, semicircular tracks interconnecting the first and second pair of tracks; a plurality of vehicles movably supported on the tracks; a drive wheel on each vehicle; and means mounting the drive wheel for engagement with the rotary drive shafts and at a position oblique to the axis of the rotary drive shafts to drive the vehicle as the rotary drive shafts are rotated; the transfer mechanism including:

an elongate member for engaging one of the vehicles;



drive means for driving the elongate member through a path concentric with the concentric tracks to move the engaged vehicle therealong;

mounting means for mounting the elongate member for movement between an operative position engaged with the vehicle and an inoperative position removed therefrom; and

the elongate member having means at its forward end for engaging a preceding vehicle and camming the elongate member to inoperative position;

whereby the vehicles are transferred from the first pair of tracks to the second pair of tracks unless a preceding vehicle is encountered by the elongate member.

3,866,538

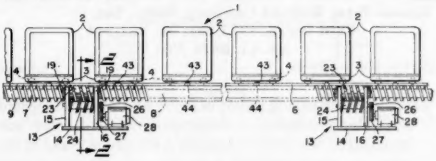
PASSENGER CONVEYOR

Thomas Forsey, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 217,735, Jan. 14, 1972, abandoned. This application July 5, 1973, Ser. No. 376,422

Int. Cl. B61b *13/00*

U.S. Cl. 104—167 **9 Claims**



1. A screw driven conveyor having a driven platform, a screw with a continuous helical rib having a radially outer cylindrical surface and a continuous helical driving surface providing a helical groove with a cylindrical surface at the root diameter of said screw, and a driven member mounted on said platform and extending into said helical groove in continuous driven engagement with said helical driving surface of said helical rib comprising a supporting structure, at least three roller members mounted on said supporting structure at circumferentially spaced-apart positions around said screw with the distances between said roller members being less than the outer diameter of said outer surface of said helical rib and the angular spacing of one of said roller members with relation to at least two other roller members being at angles greater than 90° around the circumference of said screw, each of said roller members having a length less than the length of said screw and being in rolling engagement with at least one of said cylindrical surfaces of said screw, one of said cylindrical surfaces of said screw having gear teeth and the outer surface of one of said roller members having gear teeth for meshing engagement with said gear teeth of said screw, and power means to rotate the roller member in meshing engagement with said screw whereby radial movement of said screw in all directions is restrained for positively holding the roller member in meshing engagement with said screw and said screw is rotated moving said driven member axially of said screw in said helical groove between said roller members and thereby propelling said driven platform along the length of said screw.

3,866,539

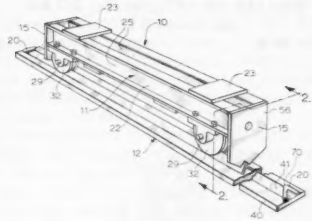
WHEEL GUARD AND TRAVEL STOP ARRANGEMENT

William James Gasser, Long Grove, Ill., assignor to Brite-O-Matic Manufacturing Inc., Arlington Heights, Ill.

Filed Oct. 1, 1973, Ser. No. 402,059

Int. Cl. B61k *7/18*

U.S. Cl. 104—249 **5 Claims**



1. A wheel guard and travel stop arrangement for the carriage of a car washing device or the like, comprising:

a. a carriage frame having a front wheel and a rear wheel,

b. an elongated track on which said carriage frame is seated with said wheels supported by a load bearing member of said track for rolling movement thereon,

c. a wheel guard plate mounted on said carriage frame over said track adjacent each of said wheels,

d. each of said wheel guard plates having a lower surface with a segment thereof substantially complimentary in shape to the cross-sectional configuration of the load bearing member of the track and spaced a short distance therefrom,

e. each of said wheel guard plates also having lower surface segments which bracket said complimentarily shaped lower surface segment and are inclined upwardly therefrom to substantially avoid engagement with foreign objects outside the lateral scope of the wheels, and

f. stop means on each end of said track for engagement by a corresponding guard plate to limit travel of the carriage in both directions.

3,866,540

ROLL STABILIZED RAILWAY CAR

Sven E. Camph, Nya Agnesfridsvagen 186F, Malmo, Sweden

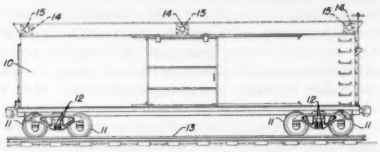
Continuation-in-part of Ser. Nos. 802,854, Feb. 27, 1969, abandoned, and Ser. No. 162,993, July 15, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,726

Int. Cl. B61f *5/06, 5/24, 5/50*

U.S. Cl. 105—1 A **2 Claims**

1. In a railway car supported on a truck having a spring mounted truck bolster and including rigid wheels riding on rails pivotably connected to car bolster through center bearing means, a mass slidably mounted contiguous to the top of said car in a plane of substantial car body oscillation amplitude

about said pivotal connection for restricted movement in a laterally transverse direction to the longitudinal axis of said



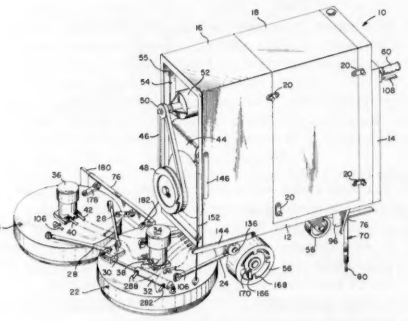
car, said mass having sufficient weight to create an opposing force sufficient to minimize the transverse roll motion of said car body about said pivotal connection.

3,866,541

SELF-PROPELLED FLOOR CLEANING APPARATUS WITH MOVABLE BRUSH

James M. O'Connor, Seattle; Raymond A. Nelson, Portland, and Gary L. Hunter, Milwaukee, all of Wash., assignors to James M. O'Connor and Donald M. Goodfellow, both of Edmonds, Wash.

Filed Mar. 24, 1972, Ser. No. 237,846
Int. Cl. A47l *11/00*
U.S. Cl. 15—50 R **12 Claims**



1. A machine for cleaning a surface comprising:

a frame supported by wheels and having a forward end and a rearward end, said wheels including a pair of spaced drive wheels interconnected by a rigid axle, said axle mounted for rotation in said frame, said wheels mounted for rotation on said axle,

differential drive means associated with said axle and each of said drive wheels, said differential drive means being adapted to drive each said drive wheel in a first direction responsive to rotation of said axle in said first direction and being adapted to allow said axle to rotate in said wheel when said axle is rotated in the opposite direction from said first direction,

a self-contained prime mover mounted on said frame,

a first rotary brush means having a first sub-frame mounted on the forward end of said frame, said first brush means being adapted to contact said surface,

a second rotary brush means having a second sub-frame located adjacent to the forward end of said frame and adjacent to said first brush means, said second brush means being adapted to contact said surface,

means mounting said second sub-frame on said first sub-frame for movement between a first position located sidewardly of said first brush means and a second position located substantially forwardly of said first brush means, whereby as said machine travels forwardly said first brush means contacts said surface along a path substantially the same as said second brush means when said second brush means is in said second position, and

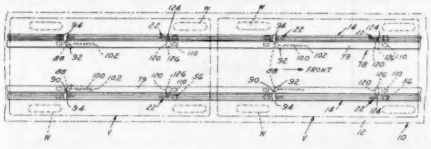
transmission means operatively coupling said prime mover to drive said first and second rotary brush means and operatively coupling said prime mover to drive said axle.

3,866,542

SECUREMENT SYSTEM FOR RAIL CARS

Donald J. Blunden, Southfield, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich.

Continuation-in-part of Ser. No. 262,234, June 13, 1972, Pat. No. 3,797,410. This application Aug. 16, 1972, Ser. No. 281,210
Int. Cl. B60p *7/08;* **B61d** *45/00*
U.S. Cl. 105—368 R **12 Claims**



1. Apparatus for securing a vehicle on the elongated deck of a transport, comprising guide means including a rail disposed on and extending lengthwise of the deck, locking means including an elongated member having a plurality of longitudinally spaced locking lugs and being mounted lengthwise upon the deck for movement between first and second positions, and a shoe carried by the vehicle and having a plurality of longitudinally spaced cooperating means thereon adapted to be engaged by said locking lugs, said shoe being guided along said rail when the vehicle is advanced lengthwise of the deck, said rail having means engageable with said shoe to restrain upward movement of said shoe relative to said rail, said locking lugs on said elongated member being engageable with said cooperating means on said shoe in said first position of said elongated member to secure the vehicle as aforesaid and being disengageable from said cooperating means on said shoe in said second position to release the vehicle, the particular locking lugs engaged with said cooperating means on said shoe in said first position of said elongated member depending upon the position of the vehicle lengthwise of the rail car.

3,866,543

SWING DECK LOCKING DEVICE

James W. Richard, Denison, Tex., assignor to Missouri-Kansas-Texas Railroad Company, Dallas, Tex.

Filed Dec. 6, 1973, Ser. No. 422,344
Int. Cl. B61d *3/02*
U.S. Cl. 105—368 R **3 Claims**

1. A control lever locking device, comprising:

a locking plate having means defining a vertically elongated slot which includes a vertically elongated main run bounded at one lateral extent by a straight side and at the other by means defining a plurality of vertically spaced notches which open toward the straight side;

an operating lever;

fixed means behind the slot pivotally mounting the operating lever;

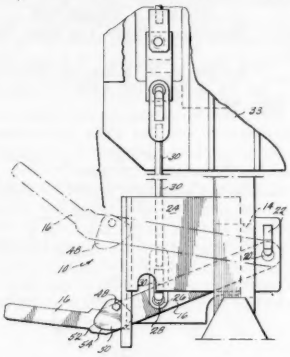
said operating lever protruding out through the slot for manual movement up and down the main run of the slot, the operating lever being sized and constructed to be laterally movable between the main run of the slot and each notch when at the respective level thereof;

means on the operating lever for connecting the lever to whatever is to be actuated upon movement of the operating lever up and down in the slot;

pivot pin means extending laterally from the operating lever toward said straight side near the locking plate;

a cam pivotally hanging from said pivot pin and normally extending substantially in the main run of said slot and forwardly of the locking plate, the cam being positioned to be manually grasped and pivoted forwardly and upwardly about the pivot pin means to clear the main run of the slot;

the composite thickness of the cam and the operating lever where the cam is mounted, compared to the width of the slot being such that:



a. the cam cannot be in the main run of the slot unless the operating lever is stationed in one of said notches;

b. the operating lever when stationed in one of said notches cannot be removed therefrom unless the cam is pivoted forwardly and upwardly as aforesaid; and

c. when the operating lever is moved from the main run to one of said notches, the cam pivots into the main run of the slot under the influence of gravity.

3,866,544

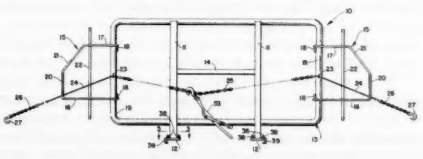
TRAILER BULKHEAD

Floyd W. Rothell, P.O. Box 232, Anson, Tex. 79501

Filed May 23, 1974, Ser. No. 472,807

Int. Cl. B60p *7/14*

U.S. Cl. 105—376 **7 Claims**



1. A bulkhead for freight carrying trailers comprising a pair of rigid uprights, means mounting said uprights on the center beams of a trailer platform, an elongated rigid frame extending across and secured to said uprights and supported thereby crosswise of the trailer platform for engagement against an end of a freight load, a pair of side members hingedly mounted on end portions of said frame and swingably movable into positions to embrace portions of the sides of the load, and non-elastic flexible means having end portions adapted to be anchored to side portions of the platform and extending across the exterior of said side members and longitudinally across said frame for anchoring the bulkhead to the platform and against the load.

3,866,545

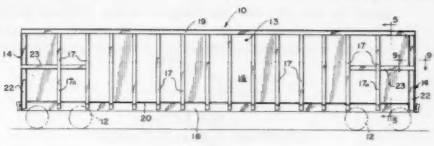
HIGH SIDE GONDOLA CAR

James C. Heap, Munster, Ind., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed May 22, 1974, Ser. No. 472,351

Int. Cl. B61d *5/00*

U.S. Cl. 105—406 **9 Claims**



1. In a railway vehicle having spaced side wall units interconnected with end wall units and each side wall unit including a longitudinally extending side sill and a vertically upwardly spaced side plate interconnected with the side sill through a side wall sheet and a plurality of vertically extending wall posts, and corner posts positioned at the corner junction of each side wall and end wall units, the improvement comprising:

each side wall unit having end portions with horizontally extending bracer members having a first end portion fixedly connected to the associated corner post;

said end wall unit including an end sill extending transversely of the vehicle and interconnecting portions of each spaced side sill;

an end plate positioned atop the end wall unit and including attaching end portions in interconnecting the adjacent side plate of each side wall unit;

a plurality of end wall reinforcing beams extending transversely of the vehicle from the associated corner posts;

an end sheet forming an enclosure for the end wall unit and being fixedly attached to the associated reinforcing beams, end sill, and end plate; and,

said reinforcing beams of the end wall unit including a connecting beam having side end portions attached adjacent the associated horizontally extending bracer member of the side wall unit and thereby combining with the end plate and end sill to transmit end forces into the side wall units.

3,866,546

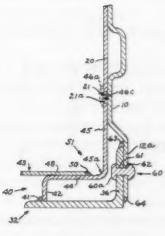
BOX CAR END STRUCTURE

Lowell L. Malo, St. Peters, Mo., assignor to ACF Industries Incorporated, New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,462

Int. Cl. B61d *17/00*

U.S. Cl. 105—410 **16 Claims**



1. A box car end structure comprising:

an end sill having a generally horizontal portion extending inwardly toward the center of the car and a generally vertical extension at the end of the car;

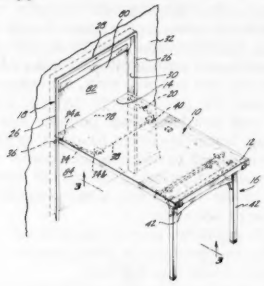
a box car end having integrally affixed thereto a flat end liner; said box car end having an outwardly extending offset adapted to engage the vertical extension of said end sill; means integrally holding said offset portion in engagement with the vertical extension of said end sill; a floor support member integrally affixed to the horizontal portion of said end sill, said floor support member having a generally horizontal portion adapted to support a floor panel in the car, and an integral upper vertical portion extending upwardly into said car, providing a generally smooth, unobstructed essentially vertical end portion of the car.

3,866,547

STOWABLE WALL TABLE

Floyd R. Guyton, 9365 N.E. 120th Place, Juanita, Wash. 98033

Filed Aug. 20, 1973, Ser. No. 389,461
Int. Cl. A47b *3/00*
U.S. Cl. 108—38 **10 Claims**



1. A stowable table, comprising:

(a) a support structure, such as a wall or cabinet structure, adapted to have said table mounted thereto;

(b) a substantially unitary table top having an inner end and an outer end, said table top having a first vertical stowed position proximate said support structure, and a second horizontal use position where it extends horizontally from said support structure;

(c) arm means connecting said table top to said support structure, said arm means having an inner end pivotally fixed to said support structure at a predetermined location on said structure, and an outer end pivotally connected to said table top at a predetermined location proximate the inner end of the table top;

(d) leg support means connected to said table top at the outer end thereof, said leg support means having a stowed position against the table top and a supporting position wherein said leg support means extend downwardly from the outer end of the table top toward a floor surface;

(e) floor engaging means at the outer end of said table top and adapted to move along in contact with the floor surface when the table top is being moved between its first and second positions, and

(f) said arm means being the sole primary connection between said table top and said support structure, such that both the inner end and the outer end of said table top are able to move away from said support structure, said arm means and said table top being so arranged relative to said support structure that the length of the arm means plus the distance from the pivot connection of the arm means on the table top to the inner end of the table equals the distance from the pivot location of the arm means on the support structure to a location on said structure proximate the inner end of the table in its stowed position, and the distance from the pivot connection of the table top to the outer end of the table top equals the length of the arm means plus the distance from the pivot connection on the support structure to the location of the outer end of the table proximate the floor surface in its stowed position, whereby,

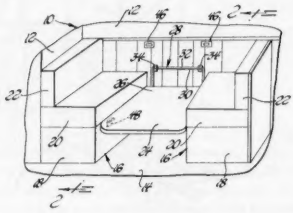
with said table top in its stowed position, the upwardly disposed inner end of the table top can be moved outwardly from said support structure, with the inner end being supported by said arm means, and downwardly positioned outer end of the table can be moved outwardly from the support structure along the floor surface, with the outer end being supported by the floor surface, and then upwardly to its use position.

3,866,548

VARIABLY POSITIONABLE ARTICLE AND SUPPORT ASSEMBLY THEREFOR

Raymond S. Skonieczny, 28129 Los Olas, Warren, Mich. 48093

Filed Feb. 5, 1973, Ser. No. 329,683
Int. Cl. A47c *19/00;* **A47b** *1/04, 83/00*
U.S. Cl. 108—79 **17 Claims**



1. A support assembly for supporting an article of furniture, or the like, wherein said article is hingedly secured at a first end portion by hinge means to a first associated support in a manner enabling said article to be vertically positionable in any one of a plurality of elevationally distinct functional positions with respect to said first associated support with said hinge means experiencing both pivotal and translational motion with respect to said first associated support and said article as said article is undergoing a change of positions from a first of said plurality of elevationally distinct functional positions to a second of said plurality of elevationally distinct functional positions, said support assembly comprising generally upwardly extending leg-like support means having an upper end thereof adapted to be continuously operatively connected to an undersurface of said article by pivot means translationally movable with respect to said article, said pivot means being translationally movable from a first translational position to at least a second translational position for enabling the easy change in position of said article from any one of said plurality of elevationally distinct functional positions to any other of said plurality of elevationally distinct functional positions, said leg-like support means having a lower end adapted to be operatively connected to second associated support structure laterally spaced from said first support structure in a manner permitting said lower end to only experience a generally pivotal motion with respect to said second associated support structure, said leg-like support being inclined with respect to the vertical as to have said upper end thereof disposed more nearly an other end portion of said article opposite to said first end portion when said article is in an elevationally lowermost position of said plurality of elevationally distinct functional positions, said translationally movable pivot means enabling said other end portion of said article to be manually raised generally upwardly as to thereby cause said first end portion to be supported by and pivotally rotate on said hinge means and cause said upper end of said leg-like support and said pivot means to translationally move with respect to said article as to move to a selected point more nearly closer to said first end portion generally midway between said first end portion and said other end portion and thereby result in said leg-like support assuming a position

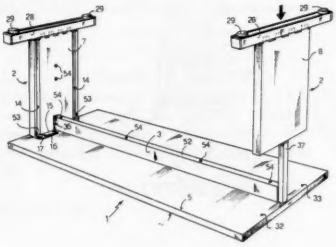
more nearly vertically disposed, said upper end of said leg-like support being effective when moved to said selected point to enable said article to be manually moved in a first direction generally away from said hinge means causing said hinge means to experience translational motion while also pivotally rotating with respect to said article thereby causing said article to undergo pivotal rotation in one direction about said pivot means whereby said other end portion of said article starts to move downwardly while said first end portion of said article starts to move upwardly, said upper end of said leg-like support also being effective when said article has been moved a sufficient distance in said first direction to enable said article to be manually moved in a second direction generally opposite to said first direction toward said hinge means causing said hinge means to continue experiencing translational motion while also continuing to experience pivotal rotation with respect to said article thereby causing said article to continue to undergo pivotal rotation in said one direction about said pivot means whereby said other end portion of said article continues to move downwardly while said first end portion of said article continues to move upwardly until said article attains an elevationally distinct functional position elevationally above said elevationally lowermost position of said plurality of elevationally distinct functional positions, said leg-like support being effective to generally pivotally rotate in a first angular direction generally about said lower end while said article is being moved in said first direction and to generally pivotally rotate in a second angular direction generally about said lower end while said article is being moved in said second direction.

3,866,549

COLLAPSIBLE TABLES

Marcello Berton, Ronchi di Massa, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Filed Sept. 6, 1972, Ser. No. 286,800
Claims priority, application Italy, Sept. 16, 1972, 69945/72
Int. Cl. A47b *3/06*
U.S. Cl. 108—153 **9 Claims**



1. A collapsible table including a working plate and comprising:

a crosspiece for bracing said working plate, said crosspiece including a lengthened portion cooperating with said working plate and two opposite ends;

two uprights, each one of said two uprights being rigidly fixed to one corresponding of said two opposite ends and extending by one side transversely to said lengthened portion;

two supporting elements for supporting said working plate, each of said supporting elements including a recess to house said crosspiece, a pair of supporting surfaces transversal to said recess for cooperating with said working plate, and a hole for being passed through by one corresponding of said two uprights; and

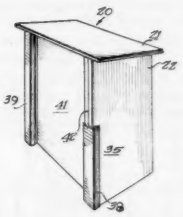
fixing members for removably securing said pair of supporting surfaces and said lengthened portion of said crosspiece to said working plate.

3,866,550

LIGHTWEIGHT FOLDABLE FURNITURE PIECE AND METHOD OF CONSTRUCTING SAME

Robert C. Geschwender, Lincoln, Nebr., assignor to Lancaster Research and Development Corporation, Lincoln, Nebr.

Filed Nov. 27, 1972, Ser. No. 309,801
Int. Cl. A47b *3/06;* **A47c** *7/00*
U.S. Cl. 108—153 **3 Claims**



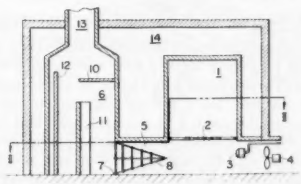
1. A foldable table or other piece of foldable furniture, including at least one unitary foldable leg member constructed of a single panel of composite material and including first and second substantially planar outer sheets and an inner core of enclosed cellular construction secured to the first and second planar sheets, the leg member having at least one foldable resilient joint constituted by two opposed lines of score indentations formed respectively in the first and second outer sheets at predesignated locations in registry with one another, said inner core and outer sheets having a resiliency when so indented, said score indentations providing sufficient outer sheet material in the outer score to expand to a substantially continuous surface and in the inner score to be resiliently crushed without substantial damage to adjacent parts of the inner core as the panel is bent through a substantial angle to form the leg member, the foldable leg member thereby being provided with at least two leg panels oriented at an angle to one another yet joined continuously thereto by the foldable joint, the leg panels mutually exerting a spring-biasing force on one another tending to return them to the unfolded position, a top member, and at least one brace member affixed to the top member on the underside thereof and abuttingly engaged by the two leg panels thereby restraining them against the biasing force tending to return them to the unfolded position.

3,866,551

COMBUSTION FURNACE

Yasuhiro Sanga, 19-26, 5-chome, Tokyo, Japan

Filed Sept. 6, 1973, Ser. No. 394,913
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **7 Claims**

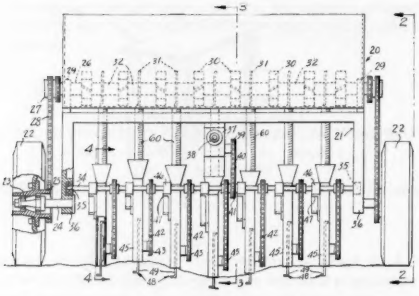


1. A combustion furnace comprising a primary combustion chamber having a roaster, a flue chamber, a secondary combustion chamber, said chambers being in communication with each other, and a conically or pyramidally shaped heat resisting steel grate disposed in said flue chamber with its tapered end oriented towards said primary combustion chamber from said secondary combustion chamber.

3,866,552
ROTO SOD SEEDER

Raymond H. Leidig, Route 3, Box 504, Lake Charles, La. 70601

Filed Oct. 11, 1973, Ser. No. 405,594
Int. Cl. A01c 5/00
U.S. Cl. 111—85 2 Claims



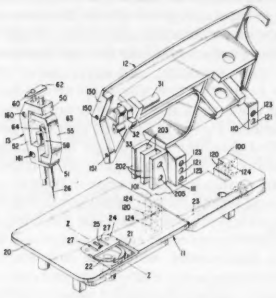
1. In a roto sod seeder, a main frame, ground engaging wheels connected to said main frame, a line shaft adjacent said frame, chain and sprocket means connecting said line shaft to said wheels, attachments mounted on said line shaft, a power gear drive unit on said frame powered from an outside power source, a power shaft operatively connected to said power gear unit, a plurality of boots, bracket means individually hingedly mounting each of said boots on said power shaft enabling each boot to follow the contour of the ground, a plurality of tiller wheels having tines for maintaining the depth of cultivation, means adjustably mounting a tiller wheel within each boot, each of said boots including a seed trough for controlling the depth of seed covering, means adjustably securing a seed trough on a bracket means, packing wheel means adjustably mounted on said bracket means for the desired amount of soil compaction around the seeds, lift means on said seeder secured to said boots for varying the width between planting rows, and a hydraulic cylinder on said seeder and connected to said lift means for selectively lifting the boots and tiller wheels, seed supply means for depositing seed into the seed troughs.

3,866,553
SEWING MACHINE FRAME CONSTRUCTION

Kenneth D. Adams, Madison, and Walter F. King, Little Silver, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 7, 1973, Ser. No. 357,963
Int. Cl. D05b 75/06
U.S. Cl. 112—258 10 Claims

1. A sewing machine frame including a bed carrying a stitch forming loop taker and formed with a work supporting surface, a bracket arm formed with means for supporting mechanism above said bed, and a sewing head carrying an endwise reciprocable needle adapted to cooperate with said loop taker in the formation of stitches, a first set of planar mating surfaces formed on said bracket arm and on said bed, said first set of mating surfaces which are on said bed being substantially perpendicular to the work supporting surface thereon, means for fastening said first set of planar mating surfaces of said bracket arm and bed together in fixed predetermined relationship, a second set of planar mating surfaces formed on said sewing head and on said bracket arm, said second set of mating surfaces which are on said bracket arm being substantially mutually perpendicular to the first set of planar mating surfaces on said bracket arm, and means for securing said second set of planar mating surfaces on said sewing head and bracket arm together with limited capacity for adjustment

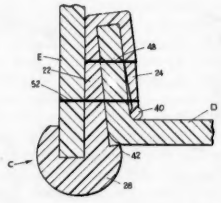


therebetween in the plane of said second set of planar mating surfaces.

3,866,554
LUGGAGE MANUFACTURE

Joseph A. Holtzman, 8201 Symphony Dr., Baltimore, Md. 21208

Filed Sept. 7, 1973, Ser. No. 395,040
Int. Cl. D05b 35/06; A45c 13/00
U.S. Cl. 112—262 4 Claims

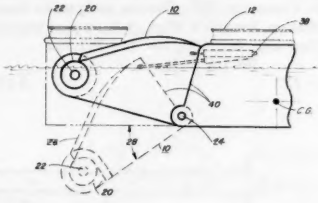


1. A method of making luggage comprising providing a flexible edge binding strip, a flexible, substantially flat side wall panel for connection to the strip, the side wall panel being generally rectangular and having a radius at each of its corners, and a flexible wall section for connection to the strip to provide the top, end and bottom walls of a luggage shell, the binding strip having in cross-section a substantially U-shaped portion providing an outer arm and an inner arm connected by a base, the outer arm having a bead at the end thereof opposite the base, the bead providing a shoulder extending from the outer side of the outer arm, positioning the side wall panel in the U-shaped portion and, while maintaining the side wall panel in substantially flat condition, urging the edge of the panel against said base while sewing through the arms and the intermediate side wall panel to provide a sub-assembly of the side wall panel having the edge binding strip around the edge thereof, and positioning the edge of said wall section against said shoulder and sewing through the adjoining portion of the aforesaid sub-assembly and the wall section.

3,866,555
APPARATUS FOR MOUNTING STERN ROLLERS IN ANCHOR PLANTING TENDERS

Mehmet D. Korkut, 3848 Veterans Hwy., New Orleans, La. 70002

Filed June 27, 1973, Ser. No. 374,207
Int. Cl. B63b 21/22
U.S. Cl. 114—0.5 R 2 Claims

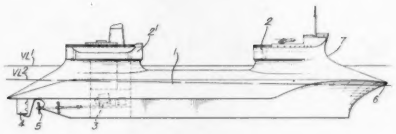


1. In a tender for leading out anchor lines and anchors in mooring semi-submersible drilling rigs and such like marine platforms, said tender having a center of gravity, a longitudinal centerline, and an indented stern symetrically arranged on said centerline; a ramp pivoted symmetrically with respect to said centerline in said indented stern with oppositely disposed free aft and forward fixed ends, said ramp being swingable between an inoperable in-hull-alignment position with said free end above said center of gravity, and an operable position with said free end below said center of gravity; and a stern roller rotatably mounted on said ramp at said free end with its axis of rotation horizontal and normal to said centerline, said stern roller being scored with a circumferential center channel symmetrically positioned with respect to said longitudinal centerline for receiving and guiding anchor lines passing thereover in leading out such and anchors to position of planting from a said drilling rig with said ramp in operable position whereby the weight of said line hanging in a catenary therebetween is supported by said tender below its center of gravity and acts to stabilize said tender in its movements.

3,866,556
SHIP CONSTRUCTION

Per Christian Sandnaes, Kaldbakkfaret 13, Oslo, Norway

Continuation of Ser. No. 126,859, March 22, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,552
Claims priority, application Norway, Mar. 20, 1970, 1059/70
Int. Cl. B63b 35/08
U.S. Cl. 114—41 7 Claims

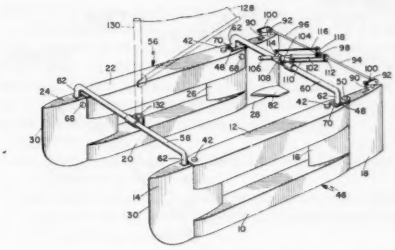


1. A ship construction of supertanker size for operation in ice-covered waters comprising a main hull with forward and aft superstructure units extending upward therefrom and being separated from one another to facilitate a reserve buoyancy and longitudinal stability of the ship, the width of said main hull being substantially greater along its length than the width of each said unit, said forward unit being spaced rearwardly from the ship's bow, said bow terminating in a point and having side surfaces extending between said bow point and said forward unit, said surfaces intersecting along a straight line extending from a lower portion of said forward unit to said bow point and sloping downwardly away from one another, said forward unit having side surfaces sloping forwardly and intersecting along a line smoothly curving into and forming an extension of said straight line, the ship being designed to travel fully loaded in open sea at a level (VL^2) located just below said bow point, each of said forward and aft units having side walls extending upwardly from said main hull and inwardly toward one another and thereafter outwardly away from one another with smooth curved sections respectively interconnecting said inward and said outward extensions thereby defining narrow width constricted base portions for both said units, said main hull having spaced outer and inner shells, ballast means defined by the space between said outer and inner shells in said main hull for maintaining the ship at substantially a level (VL^1) of said constricted base portions thereby facilitating little resistance by the ship's passage through the ice which is partly broken up by said side surfaces of said bow, the level (VL^1) being higher than the level (VL^2).

3,866,557
SEMI-SUBMERGED VESSEL ADAPTABLE TO SAILING

Thomas G. Lang, 5354 Calle Vista, San Diego, Calif. 92109

Filed Nov. 24, 1972, Ser. No. 309,187
Int. Cl. B63b 1/12
U.S. Cl. 114—61 11 Claims



1. A semi-submerged vessel, comprising,
a pair of spaced elongated lower hulls disposed completely below the water line of the vessel,
forward and rearward streamlined struts extending upwardly from opposite ends of said hulls and extending above the water line, said forward streamlined struts having water penetrating tapered leading edge portions projecting forwardly of the forewardmost portion of the hulls and said rearward streamlined struts having tapered trailing edge portions projecting rearwardly of the rearwardmost portion of the hulls, and an open space between the struts, and a superstructure supported on said struts above the water line.

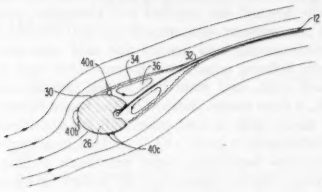
3,866,558
MAST FOR SAILING YACHTS AND METHOD

Lars Rune Bergstrom, Sodernas Fry, Varmdo, and Georg Sven Olof Ridder, Fregattvagen 12, Lidingo, both of Sweden

Filed Sept. 5, 1973, Ser. No. 394,460
Int. Cl. B63b 15/00
U.S. Cl. 114—90 21 Claims

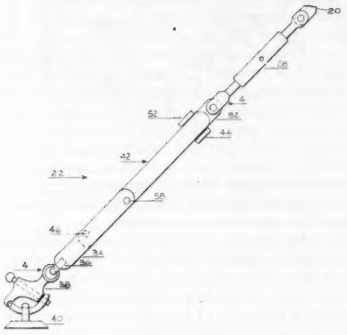
1. A mast for a sailing yacht or similar watercraft to be propelled by the lift effect by the wind on the sail; the mast comprising an elongated body having a front end and a rear end and means for attaching a sail to the rear end, and first means including individual projections on the leeward side of the mast and raised from the surface of the mast and distributed substantially throughout the length of the mast for causing air flowing around the mast to separate as a turbulent boundary layer to ultimately reduce unattached flow of air between the mast and the sail when the mast is in use, and wherein there is further included second means including

individual projections positioned on the windward side of the mast and raised from the surface of the mast and distributed substantially throughout the length of the mast and wherein there is further included third means including individual



projections on the front end of the mast and raised from the surface of the mast and distributed substantially throughout the length of the mast, said second and third means also being for use in creating a turbulent boundary layer as aforesaid.

3,866,559
STAY RELEASE
Richardt Joensen, 1701 Washington Way, Apt. 12, Marina del Rey, Calif. 90291
Filed Nov. 21, 1973, Ser. No. 417,810
Int. Cl. B63h *9/04*
U.S. Cl. 114—108 **6 Claims**



1. A sailboat having a hull and a mast extending upward from said hull, a stay secured to said mast and extending toward said hull, a stay release interconnected between said stay and said hull for the quick release of the stay so that sails may be employed in the position occupied by the stay before its release, said stay release comprising:

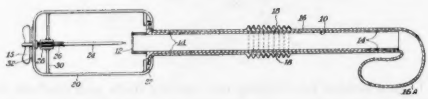
an upper link, a lower link, and a toggle link, said toggle link being pivotally mounted to both said upper link and said lower link;

connection means on said upper link connecting said upper link to said removable stay;

connection means on said lower link for removable connection to said hull of said sailboat, said connection means defining an axis through said stay release, said toggle link being pivotally connected to said upper link adjacent the lower end of both said upper link and said toggle link, said toggle link being pivoted to said lower link adjacent the upper end of said lower link and intermediate the ends of said toggle link, said pivot between said upper link and said toggle link, and said pivot between said lower link and said toggle link both being off said axis when said toggle link is in its raised position;

an upper hand-hold secured to the upper end of said upper link and a toggle hand-hold secured on the upper end of said toggle link, said hand-hold acting as stops to limit motion of said toggle link in the closed direction to a position wherein said toggle link lies substantially along said axis.

3,866,560
EMERGENCY PLUG FOR SEALING OPENINGS
John Steward, Vancouver, B.C., Canada, assignor to Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Aug. 29, 1973, Ser. No. 392,454
Int. Cl. B63b *43/16*
U.S. Cl. 114—227 **5 Claims**



1. An emergency plug comprising:

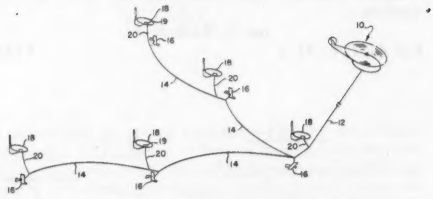
an elongated hollow tube sealed at one end, open at the other end and having perforations adjacent each end communicating with the interior;

a pressurized tank enclosing the sealed end of the tube;

an expandable sheath enclosing the tube and sealed to said tank; and

manually operable means disposed partially outside the tank and partially inside the tank to rupture the closed end of the tube and cause the sheath to inflate.

3,866,561
SELF-DEPLOYING VARIABLE FLOAT PENDANT
Charles W. Sieber, Sterling, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 25, 1973, Ser. No. 398,278
Int. Cl. B63b *21/56;* **B65h** *49/00*
U.S. Cl. 114—235 B **4 Claims**



1. A self-deploying variable length float pendant and unwinding system for minesweeping gear, comprising:

a pendant of flexible cable material for connecting a minesweeping paravane and float;

a spindle affixed in said float;

a spool attached for rotation on said spindle, and having wound thereon a length of said pendant;

a releasable detent connecting said spool to said spindle; and

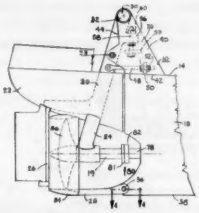
a positive detent stop on said spindle for terminating the rotation of said spool when a desired length of pendant has been payed out.

3,866,562

APPARATUS FOR RAISING UNDERWATER PROPULSION ELEMENTS ABOVE A FLOATING WATERLINE

Hector V. Pazos, 2728 Valentine Ct., New Orleans, La. 70114

Filed May 22, 1972, Ser. No. 255,497
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 R 6 Claims



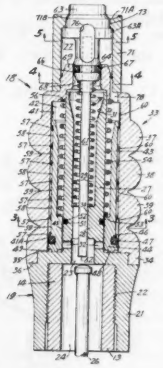
1. Apparatus for raising underwater propulsion elements of a marine vessel, having a structural deck and bottom structure, and a line shaft, and comprising: a separate fantail, having a lower frame portion, and means mounting said underwater propulsion elements including a tail shaft; upper connecting means including adjustable aligning means, mounted on said structural deck and upper adjacent end of said fantail for loosely and pivotally fastening said upper adjacent end of said fantail to said structural deck; lower connecting means integral with and engaging in said lower frame portion and said bottom structure; and shaft connecting means fixed on adjacent ends of said line and tail shafts and in plane of said upper and lower connecting means for connecting and disconnecting said shafts.

3,866,563

OPTICAL READOUT APPARATUS

Gary R. Bluem, 7980 Wynnwood Rd., Minneapolis, Minn. 55427

Filed June 4, 1973, Ser. No. 366,682
Int. Cl. B60c *23/04*
U.S. Cl. 116—34 R 13 Claims



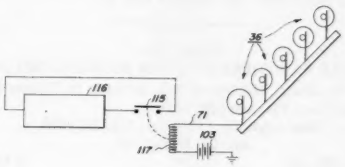
1. An optical read out apparatus to provide visual information as to the existence of a condition comprising: first means having a viewing section, second means movable relative to and adjacent the viewing section in response to a condition, said second means having information means indicating the condition, said viewing section including a transparent section having at least one annular outwardly divided bead, said bead providing an optical structure for viewing the information means when the information is located adjacent the transparent section.

3,866,564

MAGNETIC BRUSH DEVELOPING APPARATUS FOR COPIERS

Charles D. Wilson, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 25, 1973, Ser. No. 354,416
Int. Cl. G03g *13/00*
U.S. Cl. 118—10 7 Claims



1. In a reproduction machine for producing copies of originals having a photoconductive member on which latent electrostatic images of the original being reproduced are formed, with means for developing said latent electrostatic images in preparation for transfer thereof to support material, said developing means including at least one magnetic brush, together with biasing means to provide a biasing voltage on said magnetic brush, the improvement comprising:

signal indicator means;

energizing means for energizing said signal indicator means to produce a signal; and

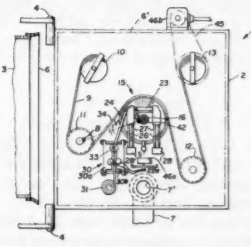
brush short responsive means responsive to shorting of said magnetic brush to actuate said energizing means whereby to produce said signal.

3,866,565

VAPOR DEPOSITION APPARATUS WITH ROTATING DRUM MASK

David E. U. Ridout, R.D. 2, Box 89, Export, Pa. 15632

Filed Dec. 21, 1973, Ser. No. 427,124
Int. Cl. C23c *13/12*
U.S. Cl. 118—49.1 9 Claims



1. Apparatus for depositing vaporized metal along the intermediate longitudinal portion of an elongated base strip, comprising a drum having central opening means extending along the entire periphery, means for rotating said drum about its axis, a source of metallic vapor on one side of said opening means, means for longitudinally moving a base strip entrained on the other side of the drum overlying said opening immediately adjacent said opening means, said source of metallic vapor being contained within said drum and comprising a boat-like container which is heated to vaporization tempera-

ture of a strip of metal progressively fed into said container, and said base strip being longitudinally driven along a portion of the outer periphery of said drum so that the inner surface exposed to said slit will become coated with said vaporized metal, the edges of the slit defining the boundaries of the coated strip, said base strip being driven by a motor and further entrained about a plurality of idler wheels, a source of potential being applied between a brush which contacts the shaft of one of said idler wheels and a brush which contacts the shaft of said drum so as to provide electric heating current to a portion of said base strip extending between the periphery of one of said idler wheels and of said drum, to effect preheating of said portion before deposition of vaporized metal thereon through said slit, and means contacting said drum beyond the area of strip contact whereby to remove excess deposited metal from the edges of said slit.

3,866,566

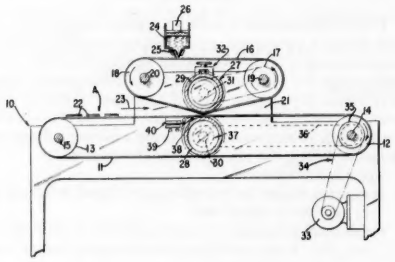
GAUZE PAD IMPREGNATION BETWEEN BELTS

Edward W. Jones, Brigantine, N.J., assignor to Pioneer Laboratories, Inc., Pleasantville, N.J.

Filed Sept. 28, 1972, Ser. No. 292,978

Int. Cl. B05c *1/02*

U.S. Cl. 118—58 **3 Claims**



1. In an apparatus for impregnating a gauze pad, the combination including a first movable belt for supporting a pad to be impregnated, a second movable belt movable in close proximity to said first belt, nip roll means straddling said two belts comprising an upper and lower roll between which mating surfaces of said belts move, means feeding impregnant to said second of said belts, said first belt carrying said pad into contact with said second belt and through said nip roll means so that impregnant will be deposited on said pad, heating means in a zone adjacent said nip roll means, and means for adjusting the distance between said rolls in accordance with the predetermined quantity of impregnant to be placed on said pad.

3,866,567

MASKING APPARATUS FOR USE IN COATING AN ARTICLE OF MANUFACTURE

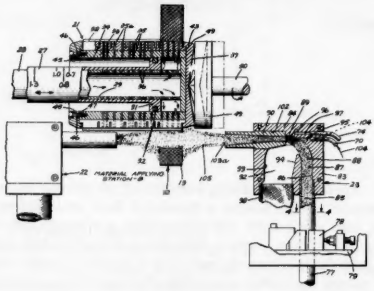
Harold L. Fritzschz, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 879,664, Nov. 25, 1969, Pat. No. 3,696,780, which is a continuation-in-part of Ser. No. 802,795, Feb. 27, 1969, abandoned. This application May 18, 1972, Ser. No. 254,478

Int. Cl. B05b *7/14*

U.S. Cl. 118—69 **9 Claims**

1. Apparatus for masking selected surfaces of an article of manufacture having at least one passageway therethrough, while other selected surfaces are being coated with a desired material, said apparatus comprising: a coolant transmitting and article support structure disposed in adjacent relationship with a contour surface of the article and having an interior region, a plurality of coolant emission ports formed in said coolant transmitting and article support structure for directing pressurized cooling fluid from the interior region of the coolant transmitting and article support structure toward the article, said ports being spaced apart at locations circumferentially around the article support structure and longitudinally along the article support structure, the ports defining a preselected flow path for the discharge of pressurized coolant from the interior region of said coolant transmitting and article support structure, said coolant transmitting and article support structure including control means for selectively restricting the admission of pressurized coolant to those ports disposed along a predetermined portion of the article support



structure adjacent to which an article is supportable to provide for selective regulation of the flow path to the emission ports during operation of the apparatus to assist in providing a predetermined masking action with respect to a given article of manufacture; said control means comprising a control member mounted to move longitudinally along the interior region of the coolant transmitting and article support structure; said coolant transmitting and article support structure including a tubular member, and said control means and tubular member being telescopically movable relative to one another whereby ports along said predetermined portion of the article support structure are selectively supplied with pressurized cooling fluid.

3,866,568

BOOKBINDING MACHINE

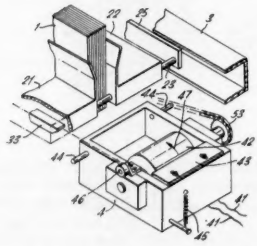
Hideo Minami, Kyoto, Japan, assignor to Taiyo Seiki Co., Ltd., Kita-ku, Kyoto, Japan

Filed Dec. 15, 1972, Ser. No. 315,594

Claims priority, application Japan, Dec. 20, 1971, 46-120373

Int. Cl. B05c *1/02*; **B42c** *9/02*

U.S. Cl. 118—238 **6 Claims**



1. An apparatus for gluing together a plurality of sheets having intersecting leading edges and binding edges, comprising:

means for clamping the binding edges of the sheets together such that they are in coincidence with a first plane and the leading edges are in alignment with one another;

means for advancing the binding edges in the first plane;

adhesive applicator means displaceable between spaced positions and yieldably biased in a first position to present a surface thereof into substantial coincidence with the first plane at a point in the travel of the binding edges; and,

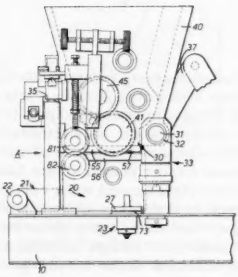
first and second cooperating cam means, said first cam means located on said clamping means and said second cam means located on said adhesive applicator means, said cooperating cam means being relatively engageable to displace said adhesive applicator means relatively away from the first plane against the bias thereon when the leading edges of the sheets approach said point in the direction of travel, and relatively disengageable when the leading edges have passed said point in the direction of travel.

3,866,569

PASTING MACHINES FOR STORAGE BATTERY PLATE GRIDS

Ronald Matley Gibson, Bolton, and Robin Gordon, Stockport, both of England, assignors to Electric Power Storage Limited, Manchester, Lancashire, England

Filed June 13, 1973, Ser. No. 369,582
Int. Cl. B05g *1/00*
U.S. Cl. 118—249 **4 Claims**



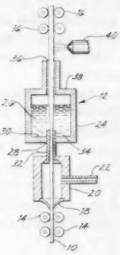
1. A pasting machine for storage battery plate grid castings, comprising opposed walls forming a passage for said grid castings, said opposed walls are formed by a pair of masking plates each having at least one aperture therein, each said masking plate being formed integrally from a single piece of metal, means for advancing castings through said passage, a reservoir for paste, means including at least one first roller for feeding paste from said reservoir through an aperture in one of said walls to each casting as it passes through said passage, said first roller having portions thereof extending into at least one aperture of at least one of said masking plates, a second roller mounted opposite said first roller for recirculating said paste to the grid casting within said passage and having a portion thereof extending into at least one aperture of the other of said masking plates, resilient means holding said walls in a normal relative position corresponding to castings of a predetermined thickness, and said resilient means being arranged to yield thereby enabling said walls to part slightly to allow the passage of castings of greater thickness.

3,866,570

CONTINUOUS CASTING APPARATUS

Santos Cruzado, Bridgeport, Conn.; Stanley Nicholas Dascaloff, Norristown, Pa.; John George Tolls, Southport, and Eugene Fraley Torvend, Bridgeport, both of Conn., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 374,331, June 28, 1973, abandoned. This application June 3, 1974, Ser. No. 475,601
Int. Cl. B05c *3/12*
U.S. Cl. 118—405 **6 Claims**



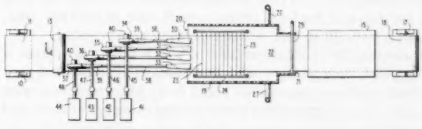
1. Apparatus for the continuous casting of meatls comprising copper by passing a metal core member comprising copper upwardly through a crucible containing molten metal comprising copper and thereby accreting and solidifying molten metal comprising copper on the core member, comprising the combination of: a crucible for the containment of molten metal comprising copper having an entry port below the surface of said molten metal for the passage of a metal core member comprising copper into the crucible and through the contents thereof, a vestibule chamber positioned adjacent to the crucible entry port, and a refractory metal cylindrical bushing member extending from within the vestibule chamber to the crucible having a cylindrical end inserted into and positioned within said entry port of the crucible and extending for a distance of about one-fourth to about one-half inch above the crucible bottom wall into the crucible.

3,866,571

APPARATUS FOR ELECTROSTATICALLY DEPOSITING A UNIFORM COATING OF FINELY DIVIDED COATING MATERIAL ON MOVING SUBSTRATES

Lowell W. Austin, and James N. Baker, both of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Aug. 15, 1973, Ser. No. 388,476
Int. Cl. B05c *5/02*
U.S. Cl. 118—621 **4 Claims**



1. Apparatus for applying a coating of metal on metallic strip comprising

an elongated housing of nonelectrically conducting material having an entrance opening and an exit opening and defining an elongated passageway extending between the entrance opening and the exit opening,

means for continuously moving metallic strip through the elongated passageway of the housing along a path in a direction from the entrance opening to the exit opening in out-of-contact relation with the material of the housing,

means located in the housing for charging metal particles introduced into the pssageway of the housing and for producing an electrostatic field in the passageway for moving charged metal particles in a direction toward the strip passing through the passageway,

and means for introducing a cloud of metal powder into the passageway at its entrance opening generally in the direction of movement of the strip through the passageway,

the last-named means including a plurality of fixed nozzles spatially positioned transversely of the path of movement of the strip through the elongated passageway,

and means for feeding to each of the nozzles a pressurized aerosol including a gas and metal powder,

each nozzle having a discharge opening in the form of a slit, each nozzle having side walls tapering outwardly in the direction of strip movement,

the angle of taper of the nozzles being no greater than 15°, the nozzles being positioned with the long dimension of the slit discharge openings lying in a common plane parallel to and spaced from the path of the strip material and with the discharge opening lying in a common plane perpendicular to the path of the strip material,

the long dimension of the slit discharge opening of each nozzle being no greater than one-fourth the width of the strip material.

3,866,572

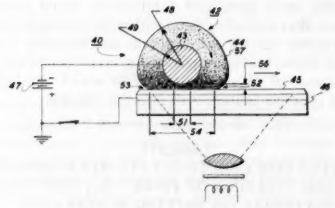
FORAMINOUS ELECTROSTATOGRAPHIC TRANSFER SYSTEM

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 29, 1973, Ser. No. 364,463

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 **18 Claims**



1. In electrostatographic apparatus wherein a transfer bias voltage is applied between a roller electrode and a first support surface to provide an electrical field for transfer therebetween while relative movement is provided between said roller electrode and said first support surface and said roller is variably deformed by said first support surface at a roller nip area with pre-nip and post-nip areas at each side of said nip area, the improvement in said roller electrode comprising:

an electrically conductive core to which said bias voltage is applied, spaced from said first support surface; and

a thick highly compressible roller body of foraminous open cell material extending between said conductive core and said first support surface and having a substantial normal uncompressed thickness;

said foraminous material occupying the space between said conductive core and said first support surface with a multiplicity of small discontinuities provided by said cells in said material and providing an ionization control barrier;

said foraminous material being highly compressed between said conductive core and said first support surface in said nip area to a thickness at least approximately one-half of said normal uncompressed thickness;

said foraminous material being much less compressed in said pre-nip and post-nip areas than in said nip area, having a much greater thickness and porosity between said conductive core and said first support surface in said pre-nip and post-nip areas than in said nip area, and said foraminous material lying over a substantial area of said first support surface, for ionization control in said pre-nip and post-nip areas.

3,866,573

ELECTROSTATIC COPYING APPARATUS

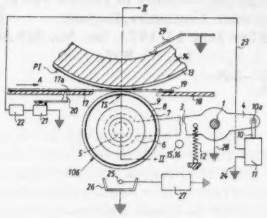
Roland Szostak, Gruenwald; Guenther Maurischat, Munich, and Ulrich Krekeler, Osterwarngau, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 24, 1972, Ser. No. 300,379

Claims priority, application Germany, Oct. 21, 1971, 2152501

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 **19 Claims**



1. In an electrostatic copying apparatus, the combination of transporting means arranged to advance a series of sheets of transfer material along a predetermined path toward, through and beyond a transfer station; an electrostatically charged xerographic surface located at one side of said path and arranged to transport powder images toward said transfer station; and a countersurface located at the opposite side of said path and arranged to maintain said xerographic surface in image-receiving contact with sheets advancing through said transfer station, said countersurface including a relatively thin sheet-contacting dielectric layer consisting of elastomeric material, a relatively thin current-conducting flexible second layer, and a relatively thick third layer consisting of elastomeric material, said second layer being disposed between said dielectric layer and said third layer.

3,866,574

XEROGRAPHIC DEVELOPING APPARATUS

James M. Hardennrook, Columbus, and Paul G. Andrus, Powell, both of Ohio, assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 332,852, Feb. 15, 1973, abandoned. This application Jan. 10, 1974, Ser. No. 432,251

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 **10 Claims**

1. An apparatus for developing a latent electrostatic image recorded on an image retaining member comprising:

a. a donor member for supporting a uniform layer of electroscopic developing material adjacent to the image retaining member, said donor member and image retaining member being spacially disposed as to create a space gap between both members;

b. means to introduce a pulse bias across said gap, said pulse being comprised of an activation potential segment in which electroscopic particles are released from the donor

member and a development potential segment of different polarity in which the electroscopic particles in non-

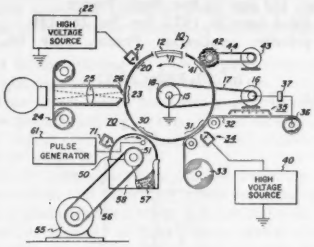


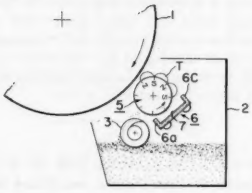
image areas are attracted towards the donor thereby preventing particle deposition in the non-image areas.

3,866,575

MAGNET ROLL DEVELOPING DEVICE

Tadayuki Kitajima, Yokohama, and Hajime Katayama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 282,713, Aug. 22, 1972, abandoned. This application July 2, 1974, Ser. No. 485,111
Claims priority, application Japan, Sept. 6, 1971, 46-68779
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **2 Claims**



1. A magnet roll developing device for supporting a magnet brush for electrophotography comprising a magnet roll having a plurality of magnets arranged axially along the circumference thereof parallel to the axis of said roll in such a way that respective adjacent magnets are of opposite polarity, a pair of collar means of non-magnetic material, each having an outer diameter equal to or slightly greater than that of said magnet roll, and magnetic brush control means disposed axially adjacent said roll, said pair of collar means being mounted respectively at opposed ends of said magnet roll to prevent bulging of said magnetic brush at said ends of said magnetic roll, said magnetic brush control means comprising a plate member having a cutting portion for cutting said magnetic brush to a predetermined uniform nap length, a nap raising portion for softening the periphery of said brush, and a cutting portion for controlling the final radial length of the brush and said magnetic brush control means being arranged so that its opposed ends extend at least into radial alignment with the outer ends of said pair of collar means.

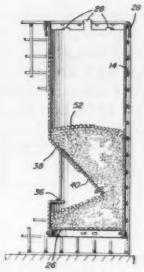
3,866,576

SMALL ANIMAL AND POULTRY FEEDER

George W. Downing, Lake Geneva, Wis., assignor to Lake Geneva Metal Spinning Company, Inc., Fort Atkinson, Wis.

Filed Oct. 3, 1973, Ser. No. 402,984
Int. Cl. A01k *5/00*
U.S. Cl. 119—18 **5 Claims**

1. A small animal feeder comprising an upstanding tubular body open at its top and closed at its bottom, said tubular body including a first upstanding side wall portion, a feed access opening formed in said first side wall portion of said body adjacent but spaced above the closed end of said body, an interior partition within said body including at least a root end portion formed integrally with and inclined inwardly and downwardly from the portion of said first side wall portion defining the upper extremity of said feed access opening and extending from said first side wall portion inwardly toward but terminating at a point spaced from the inner surface of a lower portion of the opposite wall portion of said body, the marginal edge portion of said partition remote from said one side wall portion and spaced from said opposite wall portion being spaced above the lower marginal edge portion of said opening such that the lower marginal edge portion of said opening lies



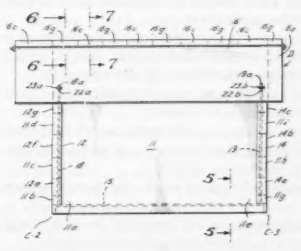
outside the angle of repose of granular material disposed on the closed bottom of said body and extending downwardly toward said one side wall portion from the marginal edge of said partition remote from said one side wall portion, the lower extremity of said feed access opening being defined by a generally horizontally disposed and inwardly struck integral lower portion of said first side wall portion, the upper marginal edge of the side wall of said tubular body including integral peripherally spaced inwardly projecting and bendable but stiff mounting tabs, said tabs including at least four tabs spaced substantially equally about the periphery of the upper end of said side wall, whereby said body may be readily suspended, by said tabs, from a wire mesh top cover of an animal cage in which said feeder is disposed.

3,866,577

PREFABRICATED ANIMAL HOUSE

Harold J. Mathis, 31 Adler Circle, Galveston, Tex. 77550

Filed May 18, 1973, Ser. No. 361,635
Int. Cl. A01k *01/02*
U.S. Cl. 119—19 **12 Claims**



1. A prefabricated animal enclosure for dogs or the like, comprising:

first and second side walls having spaced lugs at the ends thereof, said first and second wall lugs having openings therein;

front and rear walls having spaced lugs at the ends thereof, said front and rear wall lugs having openings therein;

said first and second side walls being mountable with said front and rear walls such that said openings in said first and second side walls lugs align with openings in said front and rear wall lugs;

a floor for mounting with said first and second side walls and with said front and rear walls; and

pin means for locking said first and second side wall lugs with said front and rear wall lugs and for locking said side, front and rear walls with said floor and said roof means; and

said side walls having exterior moldings integrally formed therewith to cover said aligned lugs at the corners of said animal enclosure.

3,866,578

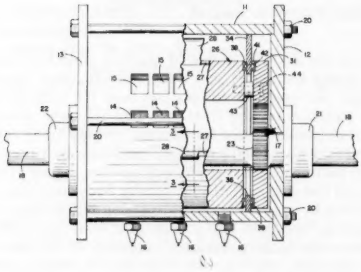
ROTARY ENGINE

Richard W. Reimer, 7915 Croesus, Los Angeles, Calif. 90001

Filed Jan. 14, 1974, Ser. No. 433,283

Int. Cl. F02b *55/14*

U.S. Cl. 123—8.45 **10 Claims**



1. A rotary engine comprising:

a tubular sleeve and a pair of cover plates disposed on opposite sides thereof, and forming a working cavity;

each cover plate having an eccentric hole aligned with the hole in the other plate;

an axially symmetrical rotor assembly disposed within said sleeve and between said cover plates, and having an axially symmetrical opening therethrough;

said rotor assembly having a plurality of radially disposed slots disposed therearound;

a vane slidably disposed in each one of said slots;

a drive shaft disposed through said rotor and said eccentric holes in said cover plates;

bearing means between each one of said plates and said shaft;

said axially symmetrical opening in said rotor assembly being of a larger diameter than said shaft;

gear means, including an internal gear on said rotor assembly, and a pinion gear on said shaft, wherein the pitch diameter of said pinion gear is of a smaller diameter than the pitch diameter of said internal gear, for coupling said shaft to said rotor assembly so that said rotor assembly is free to float with respect to said shaft.

3,866,579

ANTI-POLLUTION DEVICES FOR INTERNAL COMBUSTION ENGINES

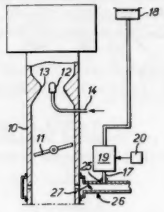
Max Serruys, 102 Rue du Bac, Paris, France

Filed June 30, 1972, Ser. No. 268,150

Claims priority, application France, July 16, 1971, 71.26080

Int. Cl. F02m *25/02*

U.S. Cl. 123—25 A **2 Claims**



1. An anti-pollution device for an engine having combustion chamber means, an induction pipe for feeding fuel-air mixture to said combustion chamber means, a throttle in said induction pipe, and air feeding means for supplying an excess of combustion air in said induction pipe, said device comprising load-sensitive liquid feeding means for spraying an aqueous liquid into the fuel-air mixture of the engine, said load sensitive feeding means comprising a liquid source, said air feeding means comprising a conduit having a throttle therein, means for feeding liquid from said liquid source into said conduit upstream of the last-named throttle and means responsive to engine load to spray said liquid at a liquid flow rate which is at its maximum when the load is high; medium when the load is medium and zero when the load is low.

3,866,580

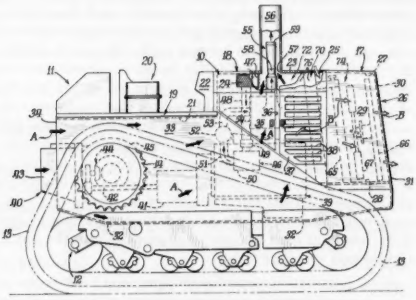
AIR-COOLED ENCLOSURE FOR AN ENGINE

Gerald E. Whitehurst, East Peoria, and Eldon D. Oestmann, Washington, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Nov. 5, 1973, Ser. No. 412,913

Int. Cl. F01p *1/02*

U.S. Cl. 123—41.7 **8 Claims**



1. An air-cooled enclosure system comprising;

a frame;

an engine supportably mounted on said frame having an exhaust pipe thereon;

an engine heat exchanger through which a liquid circulates;

outer wall means supported by said frame for generally containing said engine and said heat exchanger;

internal wall means providing a substantially enclosed engine compartment within said outer wall means having air inlet means and air outlet means relatively remotely spaced from said air inlet means, said air outlet means disposed in operative association with said engine exhaust pipe;

ejector means utilizing the flow of gases from said engine exhaust pipe for creating a relatively low pressure within said air outlet means from said engine compartment to draw ambient cooling air through said air inlet means into said engine compartment around said engine and out of said air outlet means; and

a relatively open separate engine heat exchanger compartment within said outer wall means being separated from said engine compartment by said internal wall means and providing separate air inlet passage means and separate air outlet passage means for permitting the independent circulation of ambient cooling air into said separate air inlet passage means through said heat exchanger and out of said separate air outlet passage means with a minimum of noise transmission and optimum engine cooling effectiveness.

3,866,581

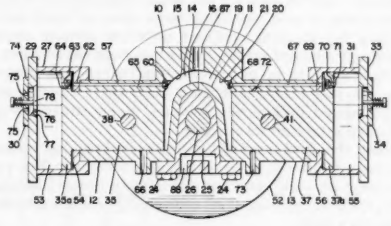
OPPOSED PISTON ENGINE

William B. Herbert, 111 Yantacow Brook Rd., Upper Montclair, N.J. 07043

Filed Sept. 10, 1973, Ser. No. 395,751

Int. Cl. F02b *25/08, 75/28*

U.S. Cl. 123—51 B **5 Claims**



1. In a two stroke engine including a housing having at least a pair of axially spaced cylinders extending therefrom in opposite directions and axially aligned with each other, means communicating with said cylinder to define a combustion chamber, means introducing fuel into said combustion chamber, a piston mounted in each of said cylinders for simultaneous reciprocating movement, said cylinders each communicating at its respective outer end with a closed extension chamber of enlarged diameter, and each of said pistons including a head of enlarged diameter complementary to and reciprocally movable within said extension, means in the closed ends of each of said extensions selectively admitting atmospheric air into said extension chamber of said cylinder upon movement of said piston toward said combustion chamber, said portion of said piston head of enlarged diameter including valve means for admitting said atmospheric air in said extension chamber from the portion of said chamber at one side of said head to the portion of said chamber at the opposite side of said head when said pistons are moved outwardly in said cylinders away from said combustion chamber communicating means, a crank shaft extending through the space between said cylinders and provided with a pair of axially spaced eccentrics for each piston, a piston pin extending diametrically through each of said pistons, connecting rods interconnecting each of said eccentrics with said piston pins, means defining passageways extending within the walls of said cylinders and said extensions parallel with the axis of the cylinders and extensions for selectively conducting air from said chambers to said combustion chamber upon movement of said piston heads toward the combustion chamber, and exhaust means associated with each of said cylinders for discharging exhaust gases from said cylinders.

3,866,582

COMBUSTION ENGINE

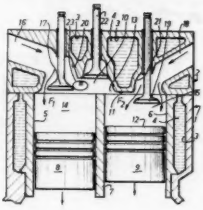
Francois A. Lagarde, Le Havre, France, assignor to Compagnie Francois de Raffinage, Paris, France

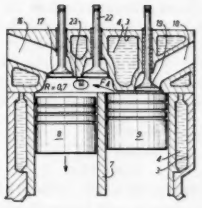
Filed Feb. 14, 1973, Ser. No. 332,375

Claims priority, application France, Feb. 15, 1972, 72.05040

Int. Cl. F02b *25/12*

U.S. Cl. 123—53 A **11 Claims**





1. A four-stroke internal combustion engine comprising an even number of cylinders in constant communication therebetween in pairs at the combustion chamber level; for each pair of associated cylinders a common exhaust valve, a first inlet valve for a first carbureted mixture, and a second inlet valve for air or a second carbureted mixture which is leaner than the first carbureted mixture; the said inlet valves being arranged in such a manner that the first carbureted mixture and the air or the second carbureted mixture are admitted into the first and second cylinders, respectively, of each pair of associated cylinders, a spark plug for each pair located in the path of the first carbureted mixture adjacent the said first cylinder; that volume of the chamber above the piston operative in each second cylinder being smaller than, and shaped to expel the second carbureted mixture or air therein into, that volume of the combustion chamber above the piston operative in each respective first cylinder; the major portion of each said combustion chamber overlying each respective first cylinder and only a small portion thereof overlying each respective second cylinder, an expulsion surface overlying each respective second cylinder adjacent each respective combustion chamber and positioned so as to be closely approached by the piston operative in each said second cylinder when at its upper dead center; and the piston of each said second cylinder is delayed a pedetermined amount with respect to each respective first cylinder, sufficient to delay any substantial expulsion of the air or leaner carbureted mixture into the first cylinder until after ignition.

3,866,583

MIXTURE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH CONTROLLED INJECTION FUEL

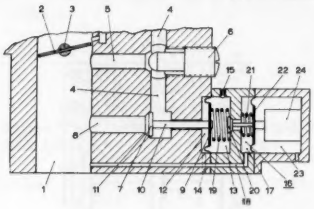
Dieter Pundt, Morse, and Gunther Schmelzer, Klein-Schoppenstedt, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 8, 1971, Ser. No. 132,300

Claims priority, application Germany, Apr. 10, 1970, 2017094

Int. Cl. F02d *33/02*

U.S. Cl. 123—97 B 9 Claims



1. A mixture control system for an internal combustion engine of the fuel injection type for supplying both fuel and air during a coasting operation wherein air and fuel are delivered separately to the intake part of each engine cylinder and wherein the fuel injection is regulated in dependence on the air intake pipe pressure, characterized in the provision of an air supply channel, a valve controlling the flow of air through said channel and operated in dependence on operational values of the engine, which values in the coasting operation assume characteristic values, said valve closing the air supply channel during idling but opening it during coasting so as to enable additional air to be supplied.

3,866,584

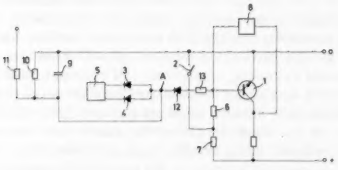
SWITCHING DEVICE AND CIRCUIT

Erhard Bigalke, Wolfsburg, and Dieter Pundt, Morse, both of Germany, assignors to Volkswagenwerk Akt., Wolfsburg, Germany

Continuation-in-part of Ser. No. 86,539, Nov. 3, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 309,556

Int. Cl. F02b *3/00*; F02d *31/00*

U.S. Cl. 123—97 B 3 Claims



1. An electronic fuel control circuit for controlling the supply of fuel to a combustion engine, comprising:

throttle switch means for controlling the fuel supply;

means for deceleration fuel cut-off additionally controlling the fuel supply in accordance with the rpm of the engine whereby the fuel supply is cut off at a predetermined rpm of said engine with said throttle switch means closed; and additional means for further controlling the fuel supply in response to the rpm of said engine whereby fuel is supplied to said engine when the engine rpm exceeds a second predetermined value greater than said predetermined rpm.

3,866,585

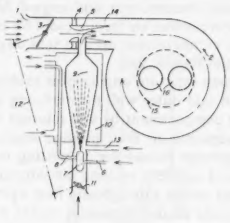
HIGH ENERGY FUEL ATOMIZATION AND A DUAL CARBURETION EMBODYING SAME

Richard D. Kopa, 6014 Wish Ave., Encino, Calif. 91316

Filed Oct. 19, 1970, Ser. No. 81,706

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A 7 Claims



1. A liquid fuel and air carburetion process for an internal combustion engine, that comprises:

providing one confined minor and one confined major stream of intake air spinning cyclonically about a longitudinal spin axis;

jetting into the minor air stream, in the downstream direction thereof, an expanding major spray of liquid fuel that is atomized by impingement by a stream of pressurized gas directed downstream along said axis so as to mix the atomized and vaporizing liquid fuel with said minor air stream, and the recycled hot exhaust gas, injected in close proximity of said expanding major spray of liquid fuel;

guiding the resulting confined turbulent mixture stream through a heated space where a complete vaporization of liquid fuel takes place and transferring said mixture stream into another unheated space where a mixing with a confined cyclonically spinning major stream of unheated intake air takes place;

guiding the final confined cyclonically spinning mixture stream to turn to one side and into a circular flow path closing on itself, such that the mixture stream continues its cyclonic spin, and spins additionally around said circular flow path;

drawing off vaporized and homogenized mixture from the mixture stream travelling around said circular flow path.

3,866,586

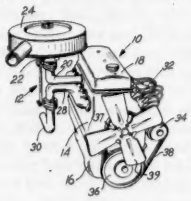
POLLUTION CONTROL DEVICE

Milford M. Scott, Jr., Las Vegas, Nev., assignor to STP Corporation, Santa Monica, Calif.

Filed Nov. 1, 1972, Ser. No. 302,938

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A 6 Claims



1. In an internal combustion engine that utilizes the compressing of a fuel-air mixture, such engine comprising an exhaust manifold means and an intake manifold means, the improvement comprising control means for regulating the flow of a portion of the exhaust gases from the exhaust manifold means to the intake manifold means, said control means including an exhaust recirculating plate means in the exhaust

manifold means, a passage communicating to the intake manifold means and a passage communicating to atmosphere, valve means in said exhaust recirculating plate means to meter the exhaust gas and/or ambient air recirculation flow in automatic self-response to the differential pressure of atmospheric pressure, intake manifold pressure and exhaust manifold pressure, so as to reduce the formation of oxides of nitrogen formed within the internal combustion engine, the flow of exhaust gases from the exhaust manifold means to the intake manifold means being controlled by the valve means which comprise a plate valve in the exhaust recirculating plate means which is operative responsive to the differential of intake manifold pressure, exhaust manifold pressure, and atmospheric pressure, for admitting fresh air into the exhaust recirculating plate means during idling, low cruise and deceleration and to precisely meter the flow of exhaust gases back to the intake manifold in all modes of engine operation.

3,866,587

AUTOMOTIVE FUEL HEATING CONTROL SYSTEM

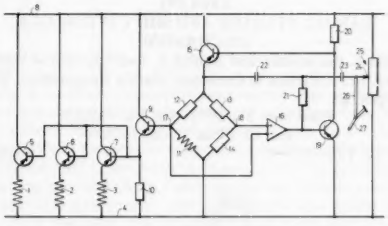
Heinrich Knapp, Leonberg-Silberberg, Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Apr. 2, 1973, Ser. No. 346,756

Claims priority, application Germany, May 17, 1972, 2224005

Int. Cl. F02m *31/00*

U.S. Cl. 123—122 F **10 Claims**



1. Automotive fuel heating control system, to control the heating effort of heating resistors (**1, 2, 3, 11**) located in the path of fuel flow to the internal combustion engine, comprising

at least one heating and heat sensing resistor (**11**) exposed to the fuel to be heated;

a reference resistance element (**12**);

an operational amplifier (**16**);

and two connecting resistors (**13, 14**), the reference resistance and the heating resistor being connected in one branch of a bridge circuit, the connecting resistors forming the other branch thereof, the operational amplifier being connected to the diagonal formed by the common junction of the reference resistance (**12**) and the heating and sensing resistor element (**11**) to sense unbalance of the bridge and to provide a resulting output signal;

means (**4, 8**) providing a supply voltage;

and means (**15, 19**) connected to and responsive to the output signal of the operational amplifier (**16**) to control the voltage being supplied from the voltage supply means to the bridge circuit, and hence the voltage applied to the heating and sensing resistor element (**11**).

3,866,588

DEVICE FOR SUPPLYING SECONDARY AIR TO A GAS ENGINE INTAKE MANIFOLD

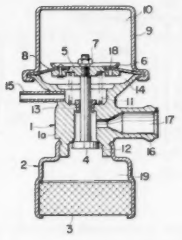
Masahiko Nakada; Takehiko Maekawa, and Hirofumi Matsumoto, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

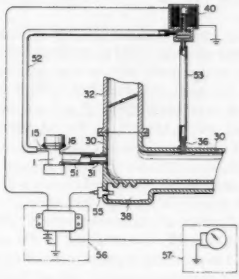
Filed Oct. 27, 1972, Ser. No. 301,266

Claims priority, application Japan, Apr. 28, 1972, 47-42279

Int. Cl. F02m *7/00, 23/04;* **F02d** *33/02*

U.S. Cl. 123—124 R **10 Claims**





1. In a gasoline engine including a carburetor, a device for supplying secondary air into the intake manifold of said engine, said device comprising a housing, means dividing the interior of said housing into a vacuum chamber and a space adjacent to and separated from said vacuum chamber, an air chamber containing secondary air to be supplied to said intake manifold, a small opening defined to extend completely through said means dividing the interior of said housing and establishing flow communication between said vacuum chamber and said space, first conduit means in communicataion with said air chamber for connecting said air chamber to said intake manifold, displaceable means within said air chamber for selectively admitting and blocking flow to said first conduit means, a connection in said housing opening into said space, second conduit means in communication with said connection in said housing opening into said space for connecting said space to said intake manifold, and means responsive to the operating conditions of said engine and associated with said second conduit means for admitting and blocking flow through said second conduit means to said space based upon the operating conditions of said engine, said displaceable means being arranged to selectively admit and block flow to said first conduit means in accordance with the blocking and admitting of flow to said space through said second conduit means by said means responsive to the operating conditions of said engine.

3,866,589
SEMICONDUCTOR CONTROLLED MAGNETO IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

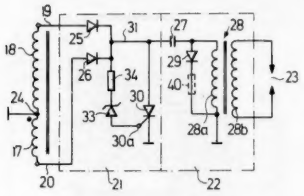
Georg Haubner, Berg, and Peter Schmaldienst, Nurnberg, both of Germany, assignors to Robert Bosch GmbH, Gerligen-Schillerhohl, Germany

Filed Feb. 8, 1973, Ser. No. 330,742

Claims priority, application Germany, Mar. 10, 1972, 2211575

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 MC **17 Claims**



1. Semiconductor controlled magneto ignition system for internal combustion engines having

a magneto generator (**10**) driven by the engine and providing output energy varying with speed of the engine,

an energy storage device (**22, 27**) connected to the magneto generator (**10**) to provide energy to a spark plug of the engine,

and an electrical control circuit including a controlled switching element (**30**) to control delivery of the stored energy to the spark plug at a proper ignition timing;

wherein the magneto generator (**10**) is wound to provide, for each revolution thereof, at least two sequential voltage half waves (U_{17}, U_{18}) to the energy storage device (**22, 27**), the first (U_{17}) of the sequential half waves having a lesser amplitude than the second (U_{18}),

wherein said electrical control circuit is arranged to respond to said sequential voltage half waves;

wherein, further, the control terminal (**30***a*) of said switching element (**30**) is connected to the storage device (**22, 27**) and is provided by said control circuit with a predetermined switching control voltage threshold level (U_Z) at which switching of the switching element into conductive state takes place, when the storage device, (U_e) reaches said threshold level so that, during low-speed operation, only the second, larger voltage half wave (U_{18}) will have sufficient amplitude to store sufficient energy in the enery storage device to reach said threshold level and, upon increase in speed of the engine, the first voltage half wave (U_{17}) will have sufficient amplitude therefor and thus cause earlier conduction of the controlled switch and hence advance of spark timing,

and wherein the resistance of the circuit, to which the energy storage device (**22, 27**) is connected for charging said energy storage device, has a value high enough to prevent charging of the energy storage device to a level at which its voltage (U_e) reaches the threshold level of the controlled switching element (**30**) when the engine operates at a speed in excess of a predetermined maximum speed and thus to effect inherent governor action.

3,866,590
DUAL SPARK IGNITION SYSTEM

Homer E. Howard, 2024 Paloma Dr., Costa Mesa, Calif. 92627

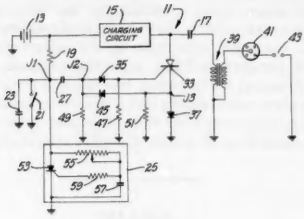
Filed Feb. 12, 1973, Ser. No. 331,685

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 BC **14 Claims**

1. An engine ignition system electrically connectible to a source of electrical energy and to first timing means which is repetitively switchable between first and second states in accordance with engine speed, said ignition system comprising:

second timing means having first and second conditions and responsive to the first timing means being in said second state for assuming said second condition a predetermined time following the switching of said first timing means to said second state;



triggering means for providing a first triggering signal in response to each switching of said first timing means to said second state and a second triggering signal in response to the first to occur of said first state and said second condition following each of said first triggering signals; and

means responsive to said first triggering signal for providing a first pulse of electrical energy for ignition and responsive to said second triggering signal for providing a second pulse of electrical energy for ignition.

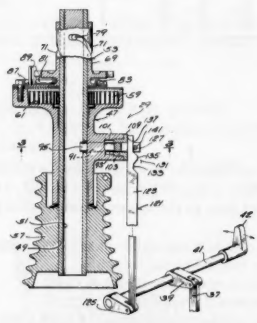
3,866,591
MANUAL STARTER AND SHIFT INTERLOCK MECHANISM

Dennis N. Burmeister, and Adolph J. Yourich, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 31, 1973, Ser. No. 365,509

Int. Cl. F02n *15/06, 15/10*

U.S. Cl. 123—179 K **9 Claims**



1. A marine propulsion device comprising an engine having a starting gear, a starter including a rotatable starter shaft having a recess with arcuately spaced ends, a pinion carried on said shaft for movement relative to said shaft and to an engaged position in mesh with said starting gear, means for rotating said starter shaft in opposite directions, cooperating means on said shaft and on said pinion for displacing said pinion to said engaged position in response to rotation of said shaft in one direction, and means cooperating with said shaft and including a selectively locatable bolt movable axially along a path in spaced parallel relation to a line extending radially from the axis of said starter shaft between a first

position in said recess to prevent rotation of said starter shaft in said one direction and a second position out of said recess to permit rotation of said starter shaft, said bolt including a side surface engagable with one of said recess ends when said bolt is in said first position to thereby prevent rotation of said starter shaft in said one direction and said bolt including an end engagable with the other of said recess ends when said starter shaft is rotated in a direction opposite to said one direction to thereby displace said bolt outwardly of said recess from said one position.

3,866,592

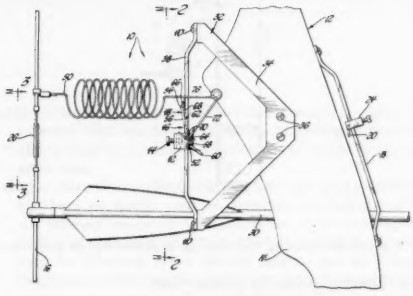
ARCHERY RELEASE INDICATING ASSEMBLY

Richard F. Carella, 35572 Strathcona, Mt. Clemens, Mich. 48043

Continuation-in-part of Ser. No. 351,836, April 17, 1973, abandoned. This application July 23, 1973, Ser. No. 381,737

Int. Cl. F41b *5/00*

U.S. Cl. 124—24 R **26 Claims**



1. An archery release indicating assembly comprising: support means adapted for attachment to an archery bow, indicator means supported by said support means for providing a signal only in response to a predetermined draw of a bowstring independently of the position of an arrow to be released, said indicator means including actuation means directly connected to said indicator means, said actuation means having means for fixed connection to a bowstring whereby said actuation means will operate said indicator means upon said predetermined draw of a bowstring.

3,866,593

FLOOR MODEL SPACE HEATER

Dan Medlock, 113 Sycamore St., Richmond, Ky. 40422

Filed Sept. 12, 1973, Ser. No. 396,383

Int. Cl. F24c *3/02*

U.S. Cl. 126—91 A **1 Claim**

1. A free standing floor model space heater intended for use in heating the surrounding air by coming in direct contact therewith, the heater comprising, in combination:

a rectangularly shaped box-like base member having a horizontal top surface and a horizontal bottom surface, the base member adapted to rest on the floor;

a pair of longitudinally extending angle iron members defining vertical standards each having one end affixed to the base member adjacent at opposite end thereof with the standards projecting vertically upwardly therefrom and terminating at the top end thereof;

an elongated hollow open end cylindrical combustion tube manufactured of sheet metal material which is rolled into a tubular cylindrical form, the combustion tube disposed horizontally above and adjacentmost to the top surface of the base, the tube having an inlet end and an outlet end;

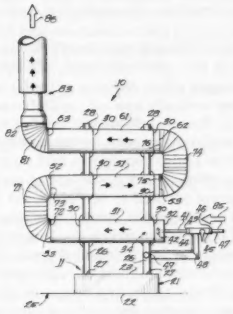
a pair of elongated rod shaped wire members member mounting opposite end portions of the combustion tube to the pair of standards to affixedly support the same thereon;

a combustion chamber portion defined at the open inlet end of said combustion tube at a disposition interiorly of said combustion tube;

a pair of identical elongated hollow open ended cylindrical first and second fire tubes each having an inlet end and an outlet end and a hollow passageway extending completely therethrough;

each of said first and second fire tubes manufactured of sheet metal material which is rolled into the tubular form of the fire tubes;

said first fire tube being disposed parallel to said combustion tube and of a slightly shorter length thereof and positioned vertically above and spaced from said combus-



tion tube extending along said pair of vertical standards, said inlet end of said first tube disposed above said combustion tube outlet end with said first tube outlet end disposed above said combustion tube inlet end;

rod like wire members passing about opposite end portions of said first tube and mountingly affixing said first tube to said pair of standards in vertical alignment with said combustion tube;

said second fire tube being disposed in vertical alignment with said first fire tube and said combustion tube and positioned vertically above and spaced from said first fire tube along said pair of standards with said second fire tube inlet end disposed above first fire tube outlet end and with said second fire tube outlet end disposed above said first tube inlet end;

rod like wire members extending above opposite end portions of said second fire tube and mountingly affixing said second fire tube to said pair of standards with the axis of said seond fire tube extending parallel to the axis of said first fire tube and said combustion tube;

said conbustion tube, said first fire tube, and said second fire tube defining a vertical plane extending parallel to said pair of standards with each of said tubes being disposed directly above and spaced from the tube therebeneath to form an efficient and compact arrangement;

said combustion tube, said first fire tube, and said second

fire tube each being of the same diameter and shape with each being manufactured of the same sheet metal material so that the first and second fire tubes are readily interchangeable with each other;

a pair of identical first and second hollow concavely curved sheet metal tubes each formed of a series of individual relatively movable segments to provide flexible sheet metal tubes in the form of flexible sheet metal elbow type structures;

said first flexible elbow tube interconnecting in an airtight manner said combustion tube outlet end with said first fire tube inlet end to direct air flow from said combustion tube through said interconnected first fire tube;

said second flexible elbow structure interconnecting said first fire tube outlet end with said second fire tube inlet end to direct air flow from said first fire tube through said second fire tube;

said first and second elbow structures each being of a hollow concave shape with each having a diameter equal to the diameter of the combustion tube, first fire tube, and second fire tube, with the elbows conducting the air flow between the interconnected tubes;

a ninety degree elbow formed of flexible sheet metal material defining a flexible tube having the same diameter of said first and second elbow structures and having one end forming an inlet end and connected in an airtight manner to said second fire tube outlet end, the opposite end of said ninety degree elbow defining an outlet end having its axis extending vertically upward parallel to said standards and normal to the axis of said second fire tube;

a gas diverter and draft control tubing having an inlet end connected in an airtight manner to said outlet end of said ninety degree elbow, the opposite end of said gas diverter and draft control adapted to be connected to a chimney to discharge air from the heater into the atmosphere exteriorly of the room in which the heater is placed;

an L-shaped brace having one end thereof affixed to the vertical standard adjacentmost the combustion tube inlet end with the brace projecting upwardly therefrom and terminating at a position forwardly of said inlet end;

a burner nozzle of an elongated cylindrical configuration having a fuel inlet port and a fuel discharge port, the nozzle being axially aligned with the inlet end of the combustion chamber with the discharge port thereof projecting into the combustion chamber concentric therewith;

an annular combustion air inlet passageway defined about said nozzle discharge port between the interior surfaces of the combustion chamber side wall surfaces and having communication with the combustion tube interior for the drawing of fresh air into the combustion tube about the discharge port of the nozzle;

a manually operable control valve having one end connected to said burner nozzle inlet port with the opposite end thereof connected to a source of burnable fuel, such as natural gas and the like, the valve operable to manually control the quantity and volume of the fuel flowing therethough between a completely "on" position and a completely "off" position, and to any selected position therebetween for accurate control of the fuel flow therethrough;

said burner nozzle and said control valve being mountedly attached to said supporting bracket; and

said fuel being injected through said control valve and through said burner nozzle inlet port to said nozzle discharge port to be injected into said combustion chamber and ignited therein to heat the combustion chamber with said heated air passing through said combustion tube, through interconnected said first and second fire tubes, and out of said gas diverter and draft control in a manner to directly heat the tubes and associated elbows to provide a direct heating effect on the air flowing about the exterior surfaces of such tubes to provide a source of heat to the room in which the heater is placed.

3,866,594

GAS FIRED HEATING INSTALLATION

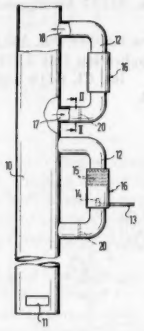
Alphons Diermayer, Diessen, Germany; Luitpold Kutzner, Marschner Strasse 78, 8000 Munich 60, Germany; Erwin Postenrieder, Mering, Germany, and Werner Diermayer, 1275 Panorama, Lafayette, Calif. 94549, assignors to Luitpold Kutzner, Munich, Germany and Werner Diermayer, Lafayette, Calif., part interest to each

Filed Feb. 5, 1974, Ser. No. 440,061

Claims priority, application Germany, Feb. 26, 1973, 2309540

Int. Cl. F24h *3/00*

U.S. Cl. 126—112 **6 Claims**



1. A gas-fired heating installation comprising, in combination:

a. a vertically extending exhaust flue;

b. a first heater assembly and a second heater assembly;

c. means for supplying air of combustion and a gaseous fuel to said first assembly, said first assembly communicating with a first portion of said exhaust flue for discharge of gases of combustion formed in said heater assembly by combustion of said gaseous fuel into said first portion,

1. said second heater assembly including

i. a branch conduit having an intake orifice and an exhaust orifice in a second portion of said flue upwardly spaced from said first portion,

ii. a burner in said conduit intermediate said orifice,

iii. supply means for supplying gaseous fuel to said burner, and

iv. flow control means in said conduit for controlling the flow of gas from said intake orifice to said burner,

2. said flow control means including means responsive to operation of said first heater assembly for increasing the flow section of said branch conduit, and responsive to the interruption of operation of said first heater assembly for reducing the flow section of said branch conduit.

3,866,595

HEATING ACCESSORY FOR USE WITH FIREPLACES

Robert E. Jones, 3650 West Amazon, Eugene, Oreg. 97405

Filed Mar. 8, 1974, Ser. No. 449,254

Int. Cl. F24b *7/00*

U.S. Cl. 126—121 **2 Claims**

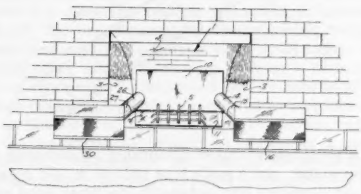
1. A forced air heating system for placement within and forwardly adjacent a conventional fireplace opening, said fireplace having a pair of side walls, a bottom wall and a back wall, said system comprising,

an elongate heat exchanger for placement lengthwise along the back wall of a fireplace rearward of a heat source, said heat exchanger defining a plenum therewithin for the reception of a pressurized flow of air, a heat exchanger base plate for the reception of a superimposed fireplace

grate, an upright heat exchanger wall integral with said base plate and partially defining said plenum,

an air intake structure disposed exteriorly adjacent the fireplace opening and including a fan and motor assembly, a collar located adjacent one end of the air intake structure,

an air exhaust structure also disposed exteriorly adjacent the fireplace opening oppositely from the air intake structure, a collar located adjacent one end of the air exhaust structure,



said air intake and exhaust structures having corresponding external wall members of identical configuration and appearance rendering the structures identical in appearance, and

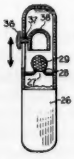
air duct means extending intermediate said intake structure and heat exchanger and intermediate the latter and the air exhaust structure in detachable connection to the collars of each said structures whereby the air duct means may be detached from the air intake and air exhaust structures permitting the latter to be interchanged for one another to reverse the flow of heated air therethrough for optimum room heating without altering the appearance of the heating system.

3,866,596

HEAT CONTROL FOR CATALYTIC HEATERS

Otto Gottwald, and Anthony Gottwald, both of 50 Debussy Ln., Ventura, Calif. 93003

Filed Oct. 18, 1973, Ser. No. 407,602
Int. Cl. A61f *7/06*
U.S. Cl. 126—208 **18 Claims**



1. A catalytic heater having an adjustable heat output comprising:

a. a fuel container having a vapor outlet;

b. a catalytic burner disposed over the outlet;

c. and a cover fitting closely over the burner that is relatively movable with respect to the burner,

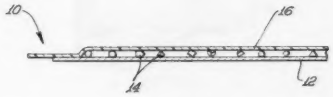
whereby greater or lesser portions of the burner surface may be exposed to ambient air for combustion of fuel vapors.

3,866,597

PROCESS AND DEVICE FOR ALLEVIATION OF NON-MUSCULAR PAIN

Steve Boxer, 1438 Benedict Canyon Dr., Beverly Hills, Calif. 94710

Filed Sept. 4, 1973, Ser. No. 393,974
Int. Cl. A61b *17/34*
U.S. Cl. 128—1 R **2 Claims**



1. A process for alleviating non-muscular pain and discomfort by applying a piece of adhesive material having a plurality of small rigid objects affixed thereon to at least one point along an acupuncture meridian so that at least one of said objects is in contact with said point and produces pressure on said point, and

maintaining said adhesive material and said objects in position for a suitable length of time.

3,866,598

PROCESSES FOR REPRODUCTION OF CELLULAR BODIES

Lynn Lawrence Augspurger, 642 Fairfax, Birmingham, Mich. 48009

Continuation-in-part of Ser. No. 418,604, Nov. 23, 1973,. This application Feb. 20, 1974, Ser. No. 444,022
Int. Cl. A61d *7/00;* **A61k** *27/00*
U.S. Cl. 128—1 R **12 Claims**

1. An embryo transplantation process by which clonally derived bodies of a specific genotype is prepared from female gametes of herbivorous and omnivorous hoofed mammals to permit reproduction of a clonal genotype comprising:

obtaining an oocyte from a selected donor mammal and placing it in a life support solution,

thereafter causing the occurance of a fertilization simulating reaction within said oocyte by exposure of said oocyte to a pseudo-fertilization means, and

inducing formation of a diploid necleus within said oocyte by fusion of a first and second genome within the cytoplasm thereof, the first of said fenomes consisting of the haploid set of chromozones contained in the pronecleus of said oocyte, and the second of said genomes consisting of the haploid set of chromozones which would normally form a polar body or consisting of that haploid set of chromozones of the pronecleus of a second oocyte which has passed the first polar body and reached the mitotic metaphase of the second maturation division.

3,866,599

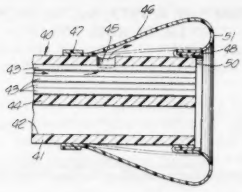
FIBEROPTIC CATHETER

Curtis C. Johnson, Lynnwood, Wash., assignor to The Board of Regents of the University of Washington, Seattle, Wash.

Filed Jan. 21, 1972, Ser. No. 219,666
Int. Cl. A61b *10/00;* **G01n** *33/16*
U.S. Cl. 128—2 L **1 Claim**

1. A catheter for insertion into the cardiovascular system comprising an elongated flexible element having a multiplicity of light-conducting fibers extending therethrough, a recess formed in the distal end of the element, the recess cutting across said fibers at an angle to the longitudinal axis of the fibers, the distal end of the catheter preventing the light conducting fibers from contacting said vessel wall, and an expand-

able sleeve located near the distal end and on the exterior of said catheter whereby upon expansion of the sleeve, it extends



beyond said element to further maintain a space between the distal end of the fibers and the end of the sleeve.

3,866,600

DIAGNOSTIC AND THERAPEUTIC APPARATUS FOR COSMETICALLY AND HYGIENICALLY TREATING SKIN

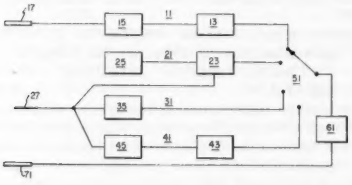
Jean Paul Rey, Paris, France, assignor to S.I.E.P.E.M., Paris, France

Filed May 3, 1973, Ser. No. 356,916

Claims priority, application France, May 8, 1972, 72.16318; Feb. 3, 1973, 73.04700

Int. Cl. A61b *5/05*

U.S. Cl. 128—2.1 R **4 Claims**



1. A therapeutic apparatus for cosmetically and hygienically treating the skin, comprising:

a. a first electrode having a relatively large area;

b. a second electrode having a relatively large area;

c. a voltage source coupled to said first electrode;

d. a third electrode having a pointed tip;

e. selector switch means coupled to said voltage source having a plurality of positions and a plurality of output terminals;

f. first circuit means for measuring the average resistivity of the skin between said first and second electrodes, said first circuit means comprising:

i. an indicator coupled to said second electrode means; and

ii. means for applying power from a first output terminal on said selector switch means to said indicator;

g. second circuit means for detecting localized deviations in the average resistance measured between said first and third electrodes, comprising:

i. an indicator; and

ii. amplifier means coupled to a second output terminal on said selector switch means and coupled to said third electrode responsive to the resistance measured between said first and third electrodes for actuating said indicator; and

h. third circuit means for obtaining a quantitative indication of the resistance between said first and third electrodes, comprising an indicator coupled to a third output terminal on said selector switch means and said third electrode.

3,866,601

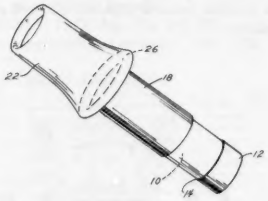
TELESCOPIC SPECULUM

James A. Russell, 35 Pinevale Ave., Reading, Mass. 01867

Filed Feb. 20, 1973, Ser. No. 334,133

Int. Cl. A61b *10/00, 17/24;* **A61m** *35/00*

U.S. Cl. 128—4 **3 Claims**



1. A telescopic speculum comprising a penetrating tube, a flexible sheath, and a guide tube slidable in said penetrating tube and extending into said sheath, the latter being attached to said guide tube, said sheath extending from the point of said attachment to the front end and then exteriorly of said penetrating tube and then extending in reverse over the end and rearwardly over the exterior of the latter, said sheath having an attaching member of greater circumference than, and extending around, said penetrating tube, said guide tube being of greater length than said penetrating tube and extending outwardly of said latter tube in all positions of use.

3,866,602

ENDOSCOPE CAMERA WITH ORIENTATION INDICATOR

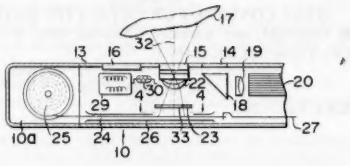
Hiroyuki Furihata, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 29, 1974, Ser. No. 474,198

Claims priority, application Japan, May 29, 1973, 48-63125

Int. Cl. A61b *1/06*

U.S. Cl. 128—6 **9 Claims**



1. An endoscope having a distal end section adapted to be inserted into a body cavity of a patient for medical diagnosis, comprising an optical means optically receiving an image of the internal wall of the body cavity through the surface of the distal end section into the interior of the endoscope; a photographing means having a film strip arranged substantially perpendicular to an optical axis of the image so received; a plate mask located in front of the film strip and substantially perpendicular to the optical axis of the image and having an image passing hole for permitting a beam of light corresponding to the image to be passed therethrough with the cross section of the beam of light defined to correspond to the shape of the image passing hole, said image passing hole having at least one symmetrical axis, and the shape of the image photographed through the image passing hole onto the film strip being similar to that of the image passing hole; and at least one mark provided at the plate mask in a manner to be asymmetrical with respect to the symmetrical axis of the image passing hole, whereby an individual imaged film frame can be viewed in a correct position.

3,866,603
METHOD OF QUENCH HARDENING WITH OIL COMPRISING MONO (POLYISOBUTENYL) SUCCINIMIDE

Dale J. Wilpers, Godfrey, Ill., assignor to Shell Oil Company, Houston, Tex.

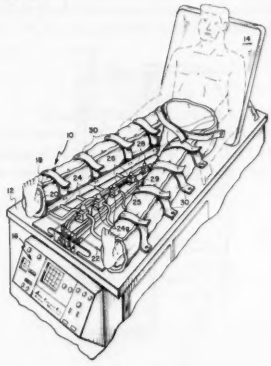
Filed Dec. 21, 1973, Ser. No. 427,204
Int. Cl. C21d *1/44*
U.S. Cl. 148—20.6 **4 Claims**

1. In a method of quenching, useful in hardening of ferrous metal, wherein a metal to be treated is heated to an elevated temperature and wherein said heated metal is then rapidly quenched in a quenching medium to increase the hardness in said metal, the improvement for simultaneously hardening said metal and imparting brightness to the metal surface which comprises using as said quenching medium a composition consisting essentially of a major portion of a mineral oil, having a high-heat exchange rate as measured by magnetic quenchometer time of from about 9 to about 15 seconds, and from about 0.1 to about 10 percent by weight of a mono(polyisobutentyl)-substituted succinimide of tetraethylenepentamine wherein the polyisobutenyl substitutent has a molecular weight of from about 750 to about 5,000.

3,866,604
EXTERNAL CARDIAC ASSISTANCE

Richard W. Curless, Nabnasset; Armando Federico, Needham; Alfred E. Magro, Woburn, and Michael L. Rishton, Reading, all of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Sept. 28, 1973, Ser. No. 401,676
Int. Cl. A61h *7/00*
U.S. Cl. 128—64 **12 Claims**



1. Apparatus for external cardiac assistance comprising:

means defining a plurality of non-distensible gas fillable bladders which are wrappable aobut a human limb and unwrappable therefrom, said means including within said bladders compression preventing means for preventing complete local compression of opposing walls thereof at any point therein while allowing lateral gas flow;

means for selectively inflating and deflating said bladders by admission of gas and withdrawal of gas therefrom to selectively pressurize the cardiovascular system at the location in the limb wrapped by said bladders;

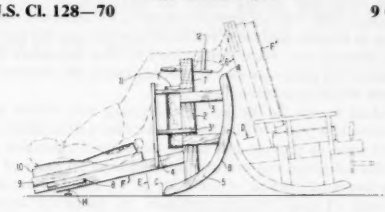
means defining a common casing blanket for overlying a series of bladder wrappings along a limb and being similarly wrappable about said limb and unwrappable therefrom along with said bladders; and

means for selectively hardening and softening the blanket casing comprising a filling of particulate material therein and means for drawing and releasing a vacuum therein to provide a substantially cylindrical reaction wall for the bladders and for softening the blanket casing to make it flexible for wrapping and unwrapping operations.

3,866,605
APPARATUS

John S. Stakeman, 2318 S. Center St., Terre Haute, Ind. 47802

Filed Apr. 2, 1973, Ser. No. 346,996
Int. Cl. A61f *5/00*
U.S. Cl. 128—70 **9 Claims**



1. An apparatus for promoting relaxation and gentle exercise of the muscles of the lower back and pelvic area so adapted that said pelvic area is suspended comprising:

a. a frame mounted on supporting means at an angle of from about 0° to about 20° below the horizontal,

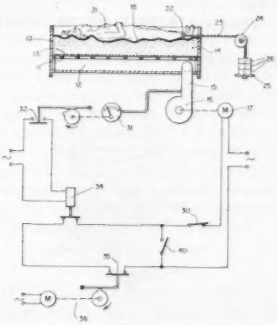
b. an adjustable rigid means for supporting the knees adapted to be linearly adjustable from said frame whereby said pelvic area is suspended, and

c. a supporting means for the upper back, shoulders and head.

3,866,606
CYCLICALLY PRODUCED CONTOURED SUPPORT

Thomas S. Hargest, 1078 Winston Dr., Charleston, S.C. 29412

Filed Sept. 4, 1973, Ser. No. 393,909
Int. Cl. A61f *5/00*
U.S. Cl. 128—71 **6 Claims**



1. The method of repeatedly forming a precisely contoured support for a patient undergoing traction, which comprises:

supporting the patient upon a mass of granular material disposed within a container,

applying traction to a selected part of the body of the patient,

while said traction is being applied fluidizing said granular material during a short period of time for movement of the patient into a position of alignment with tensional forces produced by said traction,

forming said precisely contoured support as said fluidization is terminated for prevention of movement of said patient in the direction of said tensional forces, and

for short periods of time, of the order of three seconds in every cycle of the order of 8 to 10 minutes, again fluidiz-

ing said bed of granular material to establish for each said cycle a modified precisely contoured support for the patient.

2. In a fluidized bed for support of a person said bed having:

a gas impermeable base portion,

a supporting cover affixed to said base portion and closing said base portion to define an enclosure,

a mass of granular material disposed within said enclosure, and

an air pump and driving motor for forcing a flow of gas through said mass of granular material of sufficient volume to fluidize said mass and to reduce the specific gravity thereof to a value determined by that necessary to support the person on said supporting cover, the improvement which comprises:

control means for cyclically energizing said motor to drive said pump to fluidize said mass for a short interval of time to provide in each cycle of said operation a three-dimensional uniform support over all parts of a substantial portion of the body of a patient in avoidance of concentrated pressure on restricted areas thereof,

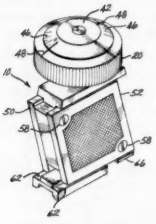
said control means after expiration of said short interval deenergizing said motor to terminate said flow of gas, said granular material then forming a relatively rigid, patient-restraining, precisely contoured, three-dimensional support over which the pressure thereon of the patient is evenly distributed in avoidance of said concentrated pressure on restricted areas thereof, and said control means after an interval of time which is long compared with said short intervals again energizing said motor to initiate a further cycle of operation for reforming said three-dimensional contoured support.

3,866,607

BONE FRACTURE COMPRESSION DEVICE AND METHOD OF USAGE

Alan K. Forsythe, and Charles J. Green, both of Vashon, Wash., assignors to Environmental Sciences Corporation, Vienna, Va.

Filed Aug. 9, 1973, Ser. No. 387,177
Int. Cl. A61f *5/04*
U.S. Cl. 128—92 R **7 Claims**



1. An orthopedic apparatus for compression of a bone fracture and extramedulary fixation of a rigid bone plate thereon said bone plate adapted to be positioned in contact with the surface of a fractured bone, aligned parallel to the axis of said bone and overlapping a fracture therein, said plate having at least two bone screw receiving apertures positioned in each overlapping portion thereof whereby at least two bone screws may enter each segment of said fractured bone, one of said apertures comprising an elongate slot adapted for situation adjacent a fracture in said bone and having means to receive a plate engaging pin means adjacent said slot; said apparatus comprising:

a frame means including a bone plate engaging flange means having a depending pin means adapted for engagement with said bone plate;

a threaded member extending upwardly from said flange means and journalled into said frame means, the end of said threaded member opposite said flange means extending beyond said frame means and carrying means for indicating torque applied thereto;

cam means having external guiding cam surfaces thereon in threaded engagement with said threaded member and adapted to translate along said threaded member in response to rotation thereof; and,

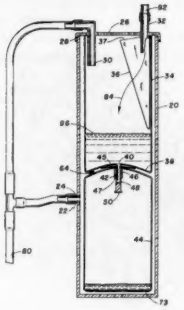
a movable subassembly carried by said frame having cam follower means drivingly interengaged with said guiding cam surfaces and adapted for translation substantially parallel to said flange means upon movement of said cam means, said movable subassembly including hook means for engaging a bone screw positioned in said elongate slot whereby rotation of said threaded member causes said pin and said hook means to move with respect to each other, the force necessary to effect such movement being shown by said means for indicating torque.

3,866,608

ASEPTIC SUCTION COLLECTION SYSTEM AND METHOD

Gordon S. Reynolds, Bountiful, and Karl A. Pannier, Jr., Salt Lake City, both of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Filed Oct. 23, 1973, Ser. No. 408,895
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **14 Claims**



2. A suction collection system including an exterior cannister and means for maintaining a negative pressure therein, a first collection reservoir, means for evacuating the reservoir and means for aspirating fluid at a remote location and means for transferring the fluid to the first collection reservoir, the improvement comprising:

a second reservoir confined within the cannister, the second reservoir comprising an aperture;

a fluid communicating conduit, telescopically uniting the second reservoir with the first; and

means associated with the fluid communicating conduit normally accommodating fluid transfer to the second reservoir and sealing the aperture concomitant with the separation of the conduit.

3,866,609

APPARATUS FOR GROWING GRAFT TUBES IN PLACE

Charles Howard Sparks, deceased, late of 3725 S.E. Martins St., Portland, Oreg. 97202 (Margaret J. Sparks, executrix)

Continuation of Ser. No. 241,189, April 5, 1972, abandoned, which is a division of Ser. No. 101,031, Dec. 23, 1970, Pat. No. 3,710,777, said Ser. No. 241,189, Continuation-in-part of Ser. No. 178,171, Pat. No. 3,703,009, is a division of Ser. No. 823,287, May 9, 1969, Pat. No. 3,625,198, which is a continuation-in-part of Ser. No. 655,838, July 25, 1967, Pat. No. 3,514,791. This application June 11, 1973, Ser. No. 368,811
Int. Cl. A61b 17/00; A61f 1/24
U.S. Cl. 128—303 R 7 Claims

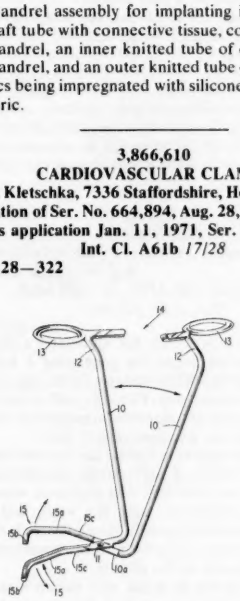
1. A mandrel assembly for implanting in a living body to grow a graft tube with connective tissue, comprising a silicone rubber mandrel, an inner knitted tube of coarse mesh fabric on said mandrel, and an outer knitted tube of fine mesh fabric, said fabrics being impregnated with silicone rubber vulcanized in the fabric.

3,866,610

CARDIOVASCULAR CLAMPS

Harold D. Kletschka, 7336 Staffordshire, Houston, Tex. 77025

Continuation of Ser. No. 664,894, Aug. 28, 1967, abandoned. This application Jan. 11, 1971, Ser. No. 105,610
Int. Cl. A61b 17/28
U.S. Cl. 128—322 13 Claims



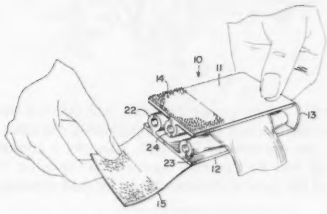
1. A surgical clamp comprising two lever arms, a pivot pin pivoting said lever arms relative to each other, each of said arms comprising a manipulating member, a shaft member, a pivot section and a jaw member, said pivot pin connecting said lever arms through said pivot sections, said shaft members being disposed at substantially right angles relative to said pivot sections and movable in a common plane with said pivot sections about said pivot pin, said manipulating members being angularly offset from said shaft members parallel to said pivot pin, and said jaw members being angularly offset from the plane of movement of said shaft members and said pivot sections for a clamping engagement with each other upon movement substantially orthogonal relative to the movement of said manipulating members.

3,866,611

INCONTINENCE DEVICE

George O. Baumrucker, 60 S. County Line Rd., Hinsdale, Ill. 60521

Filed Dec. 17, 1973, Ser. No. 425,249
Int. Cl. A61b 17/08
U.S. Cl. 128—346 3 Claims



1. A penile clamp for controlling male incontinence including a pair of clamping pieces, flexible hinge means hingedly connecting the clamping pieces together adjacent one end thereof, releasable fastening means securing the clamping pieces together at the opposite end thereof from the hinge means, pressure members on the respectively opposing faces of the clamping pieces, one of said clamping pieces having a pressure member extending continuously lengthwise substantially full length thereof and disposed substantially centrally between the two sides thereof, the opposite clamping piece having a pair of laterally spaced pressure members extending continuously lengthwise substantially full length thereof adjacent respectively opposite side edges of the clamping piece, said last-named pressure members being disposed in offset opposing relation to the first-named pressure member whereby to define an S-shaped clamping path between the clamping pieces and provide a plurality of sealing points, said clamping pieces comprising upper and lower hingedly connected members respectively, said firstnamed pressure member being disposed on the upper clamping piece, said last-named pressure members being disposed on the lower clamping piece, said releasable fastening means comprising a self-adhering device including a positive material piece fixed on the upper clamping piece, and a flexible negative material piece fixed to the lower clamping piece extending over the positive material piece and retained by friction.

3,866,612

APPARATUS FOR TREATMENT OF SKIN LESIONS

Vernon W. Buker, 514 N. State, Waseca, Minn. 56093

Filed Jan. 16, 1974, Ser. No. 433,843
Int. Cl. A61f 7/12
U.S. Cl. 128—401 4 Claims

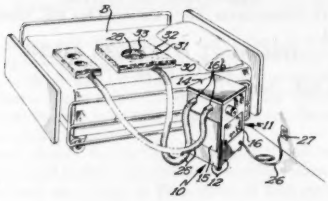
1. An apparatus for use in treating skin lesions such as bedsores of non-ambulatory patients, comprising:

a housing having a blower chamber therein, an inlet and an outlet opening in said housing communicating with said blower chamber, a blower mechanism in said chamber for producing and causing a stream of air to flow through said inlet into said blower chamber and through said outlet, an air pervious filter extending across said inlet opening for removing air entrained particles from the stream of air,

elongate flexible conduit means connected in communicating relation with said outlet,

a pad formed of flexible, yieldable material presenting a support surface for a portion of the body of the person

lying thereon, and having an opening therein corresponding to a small surface area portion of the body of the person to be treated, said pad having a thickness dimension of predetermined magnitude so that said opening therein defines a flow chamber when a patient is positioned upon the pad,



air distribution means connected with said conduit means and directing air into the flow distributing chamber defined by the opening in said pad, whereby a stream of cooled air will be directed against that specific body portion of the patient circumscribed by said opening.

3,866,613

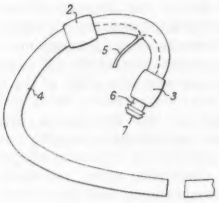
PESSARY RING ELECTRODE SYSTEM

John Kenny, and Alan Wilds, both of Welwyn Garden City, England, assignors to Devices Implants Limited, Welwyn Garden City, England

Filed Mar. 11, 1974, Ser. No. 450,244

Int. Cl. A61n *1/04*

U.S. Cl. 128—408 **6 Claims**



1. A pessary ring structure comprising first and second limbs adapted to fit together to constitute a closed flexible pessary ring, the first limb comprising a flexible arm, a metal electrode at or near each end of the arm and an insulated conductor lead connected to each electrode, the leads extending from the arm for the remote application of stimulating potentials, and the second limb comprising a flexible tube which may be cut to a desired length to make the complete ring fit a particular patient, there being provided coupling means for coupling the ends of the tube to the respective ends of the arm.

3,866,614

CARDIAC ACTUATOR

Bengt Svensson, Ronninge, Sweden, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

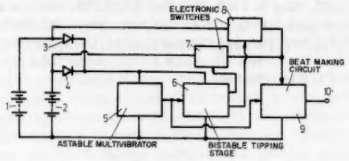
Filed Apr. 5, 1973, Ser. No. 348,237

Claims priority, application Germany, Apr. 4, 1972, 2216193

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 P **2 Claims**

1. A cardiac actuator, particularly an implantable heartbeat maker for producing heart stimulating impulses, comprising an outlet, at least two batteries, means interconnecting said batteries in parallel, a switching device comprising an astable multivibrator connected with said means, and a bistable multivibrator connected with said astable multivibrator, means for a separate connection of individual batteries, beat-making means connected to said outlet for applying the impulses to the heart to be stimulated, and means connecting said beat-making means individually with said batteries, said astable



multivibrator and said bistable multivibrator for supplying impulses produced by said astable multivibrator to said bistable multivibrator for varying the switching from one battery to the other one for supplying said beat-making means, and for supplying said impulses to said beat-making means to determine the rate of the stimulating impulses.

3,866,615

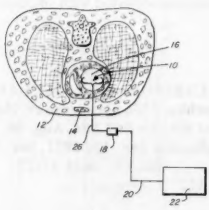
PORTABLE ELECTRONIC CARDIAC STIMULATOR

John R. Hewson, Manse., Maine, assignor to Claude W. Daigle, Ellsworth Falls, Maine, a part interest

Filed Jan. 15, 1973, Ser. No. 323,972

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 D **7 Claims**



1. A portable emergency cardiac stimulator comprising:

defibrillation circuit means for generating a high voltage electrical pulse for defibrillating a fibrillating ventricle of a heart when applied directly to the wall of said ventricle; pacing circuit means for generating repetitive low voltage electrical pulses at a predetermined rate;

transthoracically insertable bipolar cardiac electrode means for directly contacting substantially diametrically opposite portions the ventricle, said electrode means having leads trailing therefrom, such that when said electrode means are disposed interiorly of said ventricle the trailing ends of said leads may extend transthoracically and be disposed exteriorly of the patient;

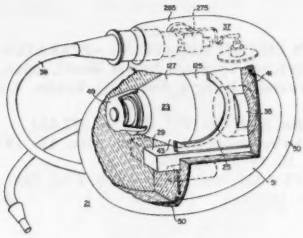
switch means, having an input, said switch means further including a common output lead, for selectively connecting the output of either of said defibrillation circuit means or said pacing circuit means to said common output lead; means for detachably connecting, in electrically conductive relation, the trailing leads of said electrode means to said common output lead to enable said electrode leads to be connected to said common output lead after transthoracic insertion of said electrode means into said ventricle; and

battery means connected to the input of said switch means for powering said defibrillation circuit means and said pacing circuit means.

3,866,616
HEART PACER

David L. Purdy, Indiana; George J. Magovern, Pittsburgh, both of Pa., and Nicholas Smyth, Bethesda, Md., assignors to Coratomic Inc., Indiana, Pa.

Filed July 12, 1973, Ser. No. 378,636
Int. Cl. A61n 1/36
U.S. Cl. 128—419 P 5 Claims

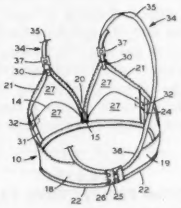


1. A heart pacer for a host including a primary source of heat energy, a converter connected to said source for converting said energy into electrical energy, means, connected to said converter, for deriving electrical pulses from said electrical energy, output-conductor means including a catheter, connected to said deriving means and to be connected to the heart of said host, for impressing said pulses on said heart, and a container for said source, converter and deriving means, the said container being composed of electrically conducting material and being electrically connected to said deriving means to serve as ground therefor, the outer region of said container being coated with electrically insulating material except over a relatively small limited area thereof on one side only, the conducting material of said limited area to be connected electrically to non-muscular body parts of said host connecting said ground to the body of said host.

3,866,617
BRASSIERE

Lawrence Gluckin, New York, N.Y., assignor to Griffin Industries Inc., New York, N.Y.

Filed Sept. 21, 1973, Ser. No. 399,325
Int. Cl. A41c 3/00
U.S. Cl. 128—484 3 Claims



1. A brassiere including a bandeau to encircle the body of a user and having a front portion shaped to define a pair of individual breast receiving cups each terminating in an apex at the top and defining a cleavage therebetween,

a rear portion having connecting means at the ends thereof, and

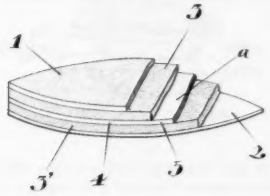
a pair of shoulder straps each connected to said rear portion at one end and at said apex of said cups, wherein the improvement comprises

a pair of breast cup fillers substantially the shape of said breast cup and connected at their upper ends and at the outer side of said cups to elastic tapes and at their bottom ends to the bottom of said cups permitting said fillers otherwise floating, independent and free of engagement with said outer breast cup.

3,866,618
NAIL FILE

Sakichi Tsukamoto, 1,3-chome, Toyotama Kita, Nerima-ku, Tokyo, Japan

Filed Jan. 4, 1974, Ser. No. 430,610
Int. Cl. A45d 29/04
U.S. Cl. 132—76.4 4 Claims

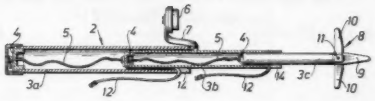


1. A nail file comprising a pair of file members backed with resilient perforated plastic layers respectively and an adhesive mixed and kneaded with a hardener to connect the said pair so that the said nail file has upper and lower filing surfaces on both sides thereof and the said adhesive becomes itself a core between the entire rear surfaces of said pair of file members.

3,866,619
POLE SYSTEM

Karl Per Frisk, Orsa, Sweden, assignor to Barracudaverken Aktiebolag, Djursholm, Sweden

Filed May 31, 1974, Ser. No. 475,187
Int. Cl. A45f 1/16
U.S. Cl. 135—15 PQ 12 Claims



1. A pole system for pitching a tent, a camouflage net, or any similar cover, comprising

at least two tube members (3), which are telescopically and slidably arranged within each other,

hoisting means (12) which at one end are fixed at the bottom end of each inner tube member and extend upwards therefrom in the play between adjacent tube members, and which have a length such that their other ends grippably extend over the upper edge of the outer tubes, and

locking means (14) at the upper end of each outer tube member, permitting the hoisting means, and thus the tube members to which they are fixed, to be locked in a desired position relative to the surrounding tube members.

3,866,620
FLUID CONTROL VALVE

Robert O. Morton, Costa Mesa, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Aug. 14, 1972, Ser. No. 280,220
Int. Cl. F15b 5/00; F15c 3/14; F15b 11/00
U.S. Cl. 137—83 12 Claims

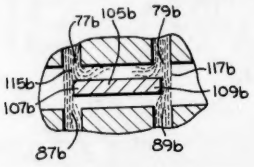
1. A servovalve connectible to a source of fluid comprising: means defining first and second receiver passages, said first

and second receiver passages having first and second receiver orifices, respectively;

ejector passage means connectible to the source of fluid, said ejector passage means having discharge orifice means spaced from said receiver orifices for discharging fluid across the space between the discharge orifice means and the receiver orifices;

a diverter having first and second opposite end portions;

means for mounting said diverter for movement in the fluid discharged by the discharge orifice means so that said end portions can be impinged by and divert the fluid discharged by said discharge orifice means relative to said said receiver orifices whereby a differential fluid output can be provided in said receiver passages, said end portions being spaced apart in the direction of movement of said diverter;



a torque motor including an elongated torque arm mounted for movement about a pivot axis which extends generally transverse to the axis of the torque arm; and

said diverter being drivingly connected to the torque arm whereby pivotal movement of the torque arm moves the diverter to control said fluid output in the receiver passages.

3,866,621

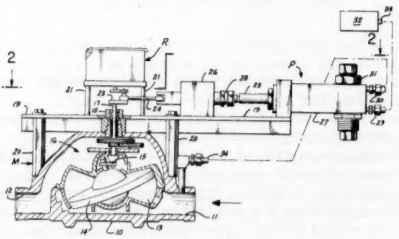
PROPORTIONING PUMP

George J. Greene, Jr., Houston, Tex., assignor to Greene Research Engineering, Co., Houston, Tex.

Continuation of Ser. No. 165,156, July 22, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,853

Int. Cl. G05d *11/02*

U.S. Cl. 137—99 **4 Claims**



1. A proportioning pump comprising:

a pump barrel having a bore therein and an inlet and outlet communicating with said bore,

a plunger positioned for reciprocation in said bore,

valving controlling said inlet and outlet so that liquid is pumped by reciprocation of said plunger,

a positive displacement liquid meter having a housing, and inlet, and outlet, a piston movable therein responsive to liquid flow therethrough, and a shaft driven responsive to movement of said piston, said shaft extending through said housing,

eccentric means directly connecting said plunger to said shaft for reciprocating said plunger responsive to rotation of said shaft,

a register having a rotary input shaft,

a base mounted on said housing, said base supporting said register so that said input shaft is in alignment with said shaft driven responsive to movement of said piston and also supporting said pump barrel and said plunger in operative relation to said eccentric means, and

means connecting said shafts whereby said register is actuated responsive to flow of liquid through said meter.

3,866,622

OPEN CIRCUIT BREATHING APPARATUS

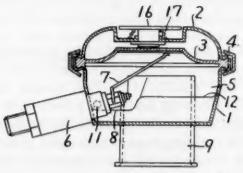
Mikio Kasahara, and Yozo Sato, both of Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe-city, Japan

Filed Mar. 19, 1973, Ser. No. 342,451

Claims priority, application Japan, Mar. 18, 1972, 47-27073; Mar. 18, 1972, 47-27074

Int. Cl. A62b *7/04;* **A61m** *16/00;* **F16k** *7/00*

U.S. Cl. 137—102 **4 Claims**



1. An open circuit breathing apparatus comprising a case, demand valve assembly means mounted on said case and including a demand valve outlet means disposed in said case, demand valve control means within said case responsive to decreases in pressure within said case to open said demand valve outlet means and responsive to increases in pressure within said case to close said demand valve outlet means, a breathing tube mounted on said case and having an opening disposed generally toward said demand valve outlet means, channel means extending from adjacent said demand valve outlet means toward said opening to said breathing tube whereby a first substantial portion of a stream of gas entering said case from said demand valve outlet means flows directly into said opening to said breathing tube and a second portion of the gas bypasses said opening to said breathing tube and flows around the inside of said case, exhaust valve means disposed through said case, a rim of limited height extending into said case and disposed along at least a portion of said exhaust valve means, said rim directing the flow of the second portion of the stream of gas which is flowing around the inside of said case over at least a portion of said exhaust valve means whereby the passage of gas directed by said rim over said portion of said exhaust valve causes a decrease in pressure adjacent said portion of said exhaust valve.

3,866,623

TRACTOR PROTECTION VALVE

Boleslaw Klimek, Des Plaines, Ill., assignor to The Berg Manufacturing Companay, Des Plaines, Ill.

Filed Dec. 10, 1973, Ser. No. 423,165

Int. Cl. B60t *15/36*

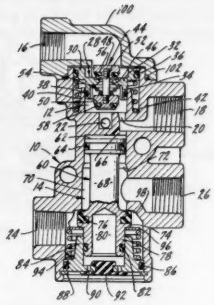
U.S. Cl. 137—102 **10 Claims**

1. A tractor protection valve including a housing having a first and second chamber, an emergency inlet and outlet and a first exhaust port in communication with said first chamber, a service inlet and outlet and a second exhaust port in communication with said second chamber and a passage in said housing opening communication between said emergency outlet and said second chamber;

a shuttle in said first chamber between said emergency inlet and outlet including a second small shuttle valve therein,

spring means urging said shuttle toward a first position and said small shuttle valve toward its closed position, closing communication between said emergency inlet and outlet, said emergency outlet being in open communication with said first exhaust port when said shuttle is in said first position;

a piston in said second chamber and means yielding urging it toward a position in which a piston seal engaged thereon closes communication between said service inlet and outlet;



fluid pressure entering said emergency inlet causing said shuttle to move initially toward a second position in which the small shuttle valve closes the first exhaust port and then toward a third position in which the small shuttle valve is forced open, completely opening communication between the emergency inlet and outlet; the resultant fluid pressure at the emergency outlet causing said piston to travel within said second chamber unseating said piston seal and thus opening communication between said service inlet and outlet.

3,866,624

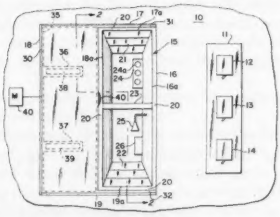
AUTOMOBILE SERVICE LANE WITH SERVICING PIT

Eric J. Peterson, 522 S.W. 11th Ct., Fort Lauderdale, Fla. 33315

Filed July 17, 1973, Ser. No. 379,961

Int. Cl. B60s *5/02*

U.S. Cl. 137—234.6 **8 Claims**



1. An automobile service area comprising:

a service lane arranged for an automobile to drive thereon for servicing,

a gasoline pump adjacent the service lane and a hose means for delivering gasoline from the pump into an automobile located in the service lane,

an automobile service pit located in the service lane at a distance from the gasoline pump but beneath an automobile parked in the service lane for receiving gasoline from the gasoline pump via the hose means and between the wheels of that automobile,

said pit being deep enough for a person to stand therein while servicing the bottom of the automobile,

and a retractable shield mounted in the service lane to selectively cover or uncover the service pit, and means mounting the shield such that it can support the weight of an automobile when in its closed position over the pit.

3,866,625

MANIFOLD FOR SELECTIVELY DISTRIBUTING A FLUID PRESSURE MEDIUM

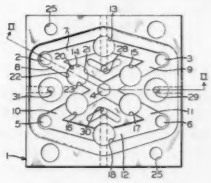
Axel Kemner, Altwarmbuchen, and Rudi Conradt, Hemmingen-Westerfeld, both of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

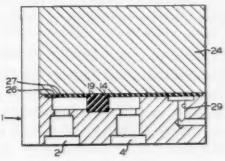
Filed Oct. 1, 1973, Ser. No. 402,049

Claims priority, application Germany, Jan. 25, 1973, 2303474

Int. Cl. F16k *11/20*

U.S. Cl. 137—269 **5 Claims**





1. A fluid pressure medium distributing manifold comprising:

a. a distributor block having formed therein:

i. a plurality of ports extending transversely through and open to opposite sides of said block, any number of said ports being available as inlet ports and any number being available as outlet ports, and

ii. a plurality of channels of uniform depth openly formed on one side of said opposite sides of said block for interconnecting the ends of said ports opening to said one side;

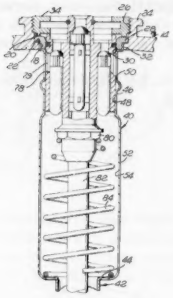
b. means removably insertable in any selected number of said channels for disrupting communication through the respective channels so selected and therefore between the ports interconnected by said selected channels, and for providing communication between the remaining inlet and outlet ports; and

c. a cap member removably and sealingly secured on said one side of said block for sealing the adjacent ends of said ports and channels against atmosphere.

3,866,626
FILLING AND TAPPING ASSEMBLY FOR BEER KEGS AND THE LIKE

Mack S. Johnston, 26 Hitching Post Dr., Rolling Hills, Calif. 90274

Continuation-in-part of Ser. No. 193,894, Oct. 29, 1971, abandoned. This application July 13, 1973, Ser. No. 378,856
Int. Cl. F16k *43/00*; B65b *31/02*
U.S. Cl. 137—322 18 Claims



1. A valve assembly for filling a keg or like container with a liquid and for dispensing a liquid therefrom, which container includes a wall having an opening therein, comprising:

a main housing having one end thereof constructed and arranged to be received and supported in the wall opening, said housing including a neck portion with an inner wall surface adjacent to said one end and a body portion with an inner surface adapted to extend into the interior of a keg in which the assembly may be mounted, said neck portion further including an annular inner sealing surface;

a valve body with an outer surface mounted in said main housing for limited axial movement therein relative to said annular surface, between a closed position in which the valve body is in sealing engagement with said annular surface and an open position in which it is spaced therefrom;

a liquid passageway extending through said valve body for the transfer of liquid from the inside to the outside of the keg when the valve body is in the closed position;

normally closed liquid valve means in the liquid passageway;

a gas passageway extending through said valve body for the transmission of gas from the outside of the inside of the keg when the valve body is in the closed position;

normally closed gas valve means in the gas passageway; and

a siphon tube having one end thereof in communication with the liquid passageway in the valve body, the other end of said siphon tube extending toward the interior of a keg in which the assembly may be mounted.

3,866,627
DUAL CHECK VALVE ARRANGEMENT

Joseph E. Dezelan, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 264,961, June 21, 1972, Pat. No. 3,779,133. This application July 9, 1973, Ser. No. 377,300
Int. Cl. F16k *15/02*
U.S. Cl. 137—512.5 3 Claims

1. A dual check valve arrangement comprising

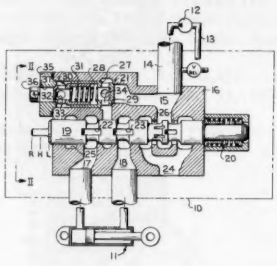
a housing having walls defining a chamber having a pair of axially spaced annular seats therein,

a pair of inlet passages formed in the housing and extending through said seats,

outlet passage means formed in said housing at one of said annular seats,

first and second check valve means reciprocally mounted in said chamber in back-to-back relationship for independently opening and closing said inlet passages at said seats,

each of said first and second check valve means comprising a cylindrical cup-shaped member having a closed end thereof normally engaging a respective one of said seats to close off the associated inlet passage while leaving the



annular seat in communication with the outlet passage means,

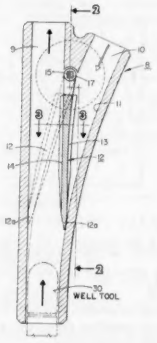
spring means mounted within said members for urging said cup-shaped members away from each other to engage said seats, and

internal passage means formed through said cup-shaped members and extending between said annular seats, said internal passage means being formed large enough to provide free fluid flow therethrough from the seat opposite the outlet passage to the seat adjacent said outlet passage.

3,866,628
DETENT DIVERTER

Ronald A. Weber, Ojai, and John K. Rains, Ventura, both of Calif., assignors to Exxon-Production Research Company, Houston, Tex.

Filed June 14, 1973, Ser. No. 370,063
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.44 6 Claims



1. Apparatus for diverting flow from one conduit into one of two other conduits comprising:

a diverter body member having branched passageways;

a paddle arranged at the junction of said branched passagewayss and movable from one position in which flow through one of said passageways is blocked to another

position where flow through said other passageway is blocked and vice versa;

a shaft nonrotatably connected to said paddle;

a cam bar having at least one arm;

said arm being nonrotatably attached to said shaft along the length thereof and having a relatively long moment and a pair of grooves formed at each end thereof, each groove having a similar curvature; and

detent bow spring means attached to said diverter body engaging one of said grooves when said paddle is in one of its diverting positions and engaging said other groove when said paddle is in its other diverting position.

3,866,629

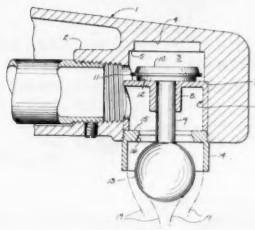
STATIC PRESSURE PISTON OPERATED DIVERTER MECHANISM

James R. Nicklas, Hales Corners, Wis., assignor to Bradley Corporation, Menomonee Falls, Wis.

Filed June 11, 1973, Ser. No. 368,639

Int. Cl. F16k *31/44*

U.S. Cl. 137—608 **3 Claims**



1. In a flow diverter mechanism for a discharge spout that has:

a. an outlet that presents a valve seat;

b. an internal cylinder region disposed inward of said outlet that has a remote end away from said outlet;

c. a fluid inlet that feeds said outlet and which is also in communication with said internal cylinder region;

d. a valve head located on the discharge side of said outlet movable toward said valve seat for engagement therewith;

e. a valve stem attached to said valve head extending toward said internal cylinder region;

f. a piston attached to said valve stem that is located in said cylinder region and which moves in unison as an assembly with said valve head and said valve stem, such piston entering into a blocking engagement with the walls of said internal cylinder region that closes off the remote end of said cylinder region when said valve head is in its engagement with said valve seat;

the combination therewith of:

i. a motion limiting ledge inside said spout located between said outlet and said internal cylinder region with said piston on one side thereof and said valve head on the other side thereof, said ledge supporting said piston and valve head assembly when said valve head is away from said valve seat; and

ii. the engagements of said valve head with said valve seat, and of said piston with the walls of said cylinder region providing one engagement that is an imperfect seal allowing fluid seepage therethrough, and a second engagement that is a substantially tight seal in relation to the imperfect seal.

3,866,630

BALL CANISTER AND SYSTEM FOR CONTROLLING CAVITATION IN LIQUIDS

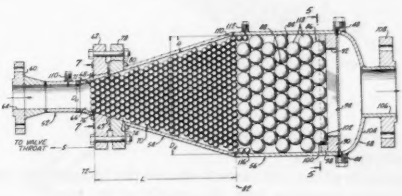
Albert A. Webb, Riverside, Calif., and James Paul Tullis, Fort Colling, Colo., assignors to Fowler, Knobbe & Martens, Orange; Fred H. Hanson, Riverside, both of, Calif.; Paul J. Tullis, Fort Collins, Colo.; Robert M. Massey, Crestline, Calif.; John M. Mylne, Riverside, Calif. and Albert A. Webb, Riverside, Calif., a part interest to each

Division of Ser. No. 95,044, Dec. 4, 1970, Pat. No. 3,731,903.

This application May 8, 1972, Ser. No. 251,256

Int. Cl. F15d *1/02*

U.S. Cl. 137—583 **12 Claims**



4. In a liquid flow system, a ball canister for receiving the liquid stream at high pressure and reducing the pressure while repressing or controlling cavitation in the liquid, said ball canister comprising a case having an inlet and outlet, a volume of balls filling a portion of the length of the case, and means retaining the balls in the case, said ball filled case portion being tapered with its diameter increasing in the downstream direction, with the diameter and length of said ball filled case portion being sized to significantly repress cavitation in said system, and with the canister including a gas tap communicating with the interior of the case at the top thereof and at a position downstream of said ball volume, and a gas pressure relief valve connected to said tap.

3,866,631

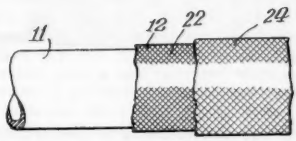
HOSE CONSTRUCTION

Anil H. Chudgar, Manitowoc, Wis., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Filed July 6, 1972, Ser. No. 269,499

Int. Cl. F16l *11/08*

U.S. Cl. 138—125 **11 Claims**

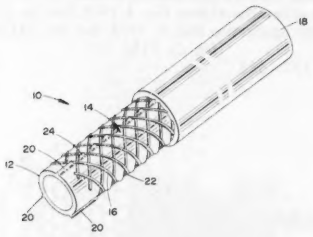


1. A hose construction comprising:

a tubular core formed of Hytrel aromatic polyester thermoplastic resin and defining a surface portion; and

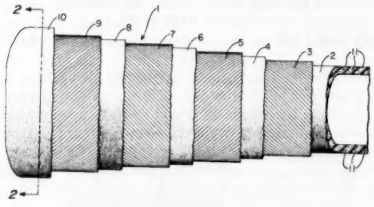
a reinforcing layer extending about the core and having an inner surface portion embedded in said core surface portion to have solely mechanically interlocked, retained association with said coore for reinforcing the same, the polyester resin of said core surface portion in which the reinforcing layer inner portion is embedded being substantially free of stress.

3,866,632
REINFORCED HOSE AND METHOD
William G. Schaffer, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.
Filed July 2, 1973, Ser. No. 375,965
Int. Cl. F16l *11/08*
U.S. Cl. 138—130 5 Claims



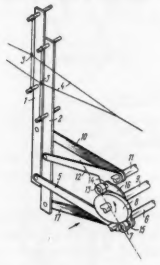
1. A flexible hose comprising:
a polymeric tube;
a plurality of circumferentially spaced ribs integral with and radially extending from the exterior of the tube;
a reinforcement of oppositely wound textile strands twined over the tube, the strands deforming portions of the ribs at points of contact therewith, undeformed portions of the ribs extending radially past the strands, and the ribs deformed to a point near the tube whereby the ribs mechanically hold and substantially maintain the strands of the reinforcement in spaced relationship on the tube; and
a cover formed over the tube, reinforcements, and ribs, the undeformed portions of the ribs extending into portions of the cover mechanically interlocking their width.

3,866,633
HOSE STRUCTURE
Challen E. Taylor, Waukegan, Ill., assignor to The Goodyear Tire and Rubber Company, Akron, Ohio
Filed June 7, 1973, Ser. No. 367,997
Int. Cl. F16l *11/08*
U.S. Cl. 138—130 13 Claims



1. A flexible wire reinforced hose of integral construction adapted to resist high pressure, said hose comprising an inner tubular member of flexible polymeric material extending longitudinally of the hose to form the innermost portion thereof at least two spaced reinforcing layers comprised of a plurality of closely spaced spirally wound flexible metallic wire elements disposed around said tubular member, and an insulating layer disposed between the said reinforcing layers with the innermost reinforcing layer in direct contact with and directly supported by the outer peripheral surface of said tubular member to provide reinforcement for the hose and with said wire elements having a small cross-sectional dimension in relation to the wall thickness of said tubular member, said tubular member including a multiplicity of lengths of short filaments of flexible relatively inert high structural strength material randomly disposed throughout the material of the tubular member and oriented generally in direction parallel to the longitudinal axis of the hose to provide strength and heat resistance.

3,866,634
SHEDDING MOTION FOR LOOM
Zinovy Yakovlevich Rutkevich, Medvedkovo, 8 kvartal, korpus 18, kv. 21; Boris Alexandrovich Sakharov, ulitsa Krzhizhanovskogo, 24/35, korpus 6, kv. 404; Alexandr Alexandrovich Zabotin, ulitsa Profsojuznaya, 96, kv. 85; Eduard Arshakovich Onikov, ulitsa Panferova, 5, korpus 2, kv. 106, and Roman Anatolievich German, ulitsa Davydkovskaya, 30, kv. 50, all of Moscow, U.S.S.R.
Filed May 8, 1973, Ser. No. 358,365
Int. Cl. D03c *5/00*
U.S. Cl. 139—79 3 Claims

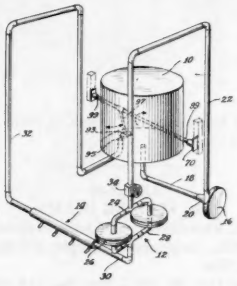


1. A shedding motion for a weaving loom, comprising; a plurality of pairs of heald shafts carrying healds for the passage of warp threads therethrough, a plurality of pairs of driving levers, each lever in each said pair of said driving levers being pivotally connected with the respective heald shaft in said pair; a plurality of pairs of driven levers, each lever in each pair of said driven levers being pivotally connected with a respective one of said heald shafts; a cam mounted intermediate of the driving levers of each pair and interacting therewith for effecting the movement of said heald shafts in a vertical plane for shedding; a driving shaft carrying said cam; followers having spindles being supported by said driving levers; a bail member mounted on the spindles of said followers and interconnecting said followers providing uninterrupted engagement thereof with said cam so as to effect synchronous flat-parallel translatory movement of said heald shafts in said vertical plane; said follower spindles being arranged so that a straight line connecting them passes through the axis of rotation of said cam; and a plurality of said pairs of driven levers being supported by the pivot axes of driving levers for each pair and being connected with the other heald shaft in the respective pair.

3,866,635
LIQUID FILLING APPARATUS
Larry Neil Pearce, Northbrook, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed July 5, 1973, Ser. No. 376,666
Int. Cl. B65b *3/04*
U.S. Cl. 141—45 11 Claims

11. In a fluid delivery and recirculating system for use in filling containers of the type which includes a reservoir; a recirculating liquid path connected to the reservoir; a plurality of containers to be filled with liquid, each of said containers having at least one inlet and diverting means adapted to divert liquid from said recirculating path to said inlet conduits of said containers; the improvement comprising:

means defining a plurality of restrictions, said restricting means disposed within said recirculating liquid path, also said restricting means being increasingly restrictive in the direction of flow; and



means defining a diversion flow path from each of said restrictions to the inlet of a different one of the plurality of containers.

3,866,636

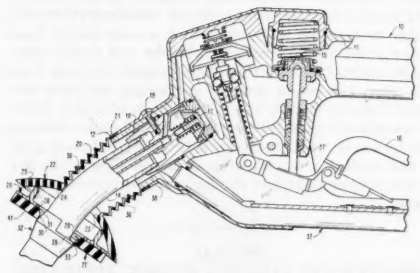
SEALING ARRANGEMENT FOR LIQUID DISPENSING NOZZLE HAVING VAPOR RECOVERY

Donald A. Lasater, Fairfield, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,799

Int. Cl. B67c *3/34*; **B65b** *31/06*

U.S. Cl. 141—59 **10 Claims**



1. A liquid dispensing nozzle having a body, a spout extending from said body and having its free end for disposition in an opening of a fill pipe of a vehicle tank or the like, and means to return vapor from the tank being filled; the improvement comprising means to form a seal between the fill pipe opening and said vapor return means when said spout is disposed in the fill pipe; said sealing means including a member mounted for sliding movement along said spout; means continuously urging said member toward the free end of said spout; said member having a sealing surface formed as a sector of a sphere; first means mounted for sliding movement along said spout and rotating movement about said spout; said first means being disposed between said member and the free end of said spout; said first means being continuously positioned to engage said sealing surface of said member to form a seal therebetween; said spout having stop means disposed thereon between said first means and the free end of said spout to engage said first means when said spout is not disposed in the fill pipe to form a seal therebetween; said vapor return means communicating with a sealed space formed between said spout, said sealing surface of said member, said first means, and said spout stop means; and said first means being removed from sealing engagement with said spout stop means while remaining in sealing engagement with said member when said spout is inserted in the fill pipe by compression of said urging means, said first means forming a seal with the fill pipe independently of said member orientation to cause communication between said vapor return means and the tank being filled.

3,866,637

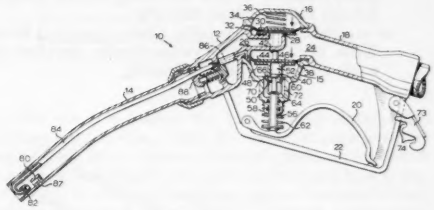
FLUIDIC AUTOMATIC NOZZLE

Leonard W. Swain, London, and Edward W. Hunter, Port Frank, both of Canada, assignors to Emco Limited, London, Ontario, Canada

Filed Feb. 2, 1973, Ser. No. 329,226

Int. Cl. B65b *3/26*, *57/06*

U.S. Cl. 141—226 **4 Claims**



1. In an automatic nozzle for use in controlling the flow of liquids having a housing having a fluid passage opening therethrough, valve means in said passage including a valve member for opening and closing said fluid passage, and means for generating a positive fluid pressure in response to the flow of liquid through said fluid passage, diaphragm means mounted in said housing forming a diaphragm chamber communicating with said means for generating a positive pressure, said means for generating a positive pressure including means for disrupting its pressure generating abiltiy in response to the level of liquid in the tank being filled rising above a predetermined height with respect to said nozzle, manually operable valve opening means movable between a first position in which said valve member is closed and a second position in which said valve is open, the improvement of

means connecting said diaphragm means and said valve means whereby said valve means moves with said diaphragm, and wherein said manually operable actuator means includes collapsible stem means extending into said housing and engaging said diaphragm means, locking means for releasably locking said stem means in an extended position in which said stem is operable to move said diaphragm to move said valve member to an open position,

and means urging said stem means to said first position to close said valve,

said releasable locking means being released when said stem means is moved to a predetermined position at least partially opening said valve and when said diaphragm chamber is positively pressurized at a pressure sufficient to move said valve closure member independently of said stem, thereafter said valve closure means being closable in response to a predetermined decrease in pressure by collapsing of said stem.

3,866,638

NON-LATCHING, DRY-BREAK FLUID COUPLING

Ray E. Mingus, Mission Viejo, and Ross M. Stuart, Santa Ana, both of Calif., assignors to Kaiser Aerospace and Electronics Corporation, Irvine, Calif.

Filed July 9, 1973, Ser. No. 377,337

Int. Cl. B65b *3/07*

U.S. Cl. 141—352 **6 Claims**

1. A releasable coupling for connecting a fluid supply unit

to a fluid receiving unit to minimize spillage of fluid during couping and uncoupling, comprising:

a housing connected with one of the units;

a passage in said housing communicating with the one unit and having an open end;

a valve seat in said passage having upstream and downstream sides facing toward and away from the open end thereof, respectively;

a plunger resiliently biased against the downstream side of said valve seat to close the same;

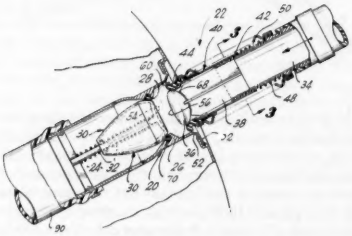
a hollow probe connected with the other of the units extending in an axial direction, said probe including,

a nose at one end of said probe;

a sleeve valve including,

a tubular, substantially rigid sleeve body surrounding said probe mounted thereon for sliding motion relatively towards and away from said nose;

an unsupported annular collar fixedly connected to said sleeve body extending concentrically therefrom towards said nose, said collar having,



an internally facing, inner peripheral surface which seats in sealing relation against said nose in a closed condition;

an outwardly facing outer peripheral surface;

means connected to said sleeve body for resiliently biasing said inner surface of said collar into sealing contact with said nose to prevent flow outwardly from said probe;

said probe being insertable into said passage through the open end thereof to move said nose against said plunger thereby depressing the same from said valve seat to enable flow therethrough, insertion of said probe seating said outer surface of said collar against the upstream side of said valve seat, further inward movement of said probe causing separation between said nose and said collar to enable fluid to flow through said probe and said valve seat into the receiver, said collar being resiliently deformable to a sufficient extent to enable it to deform into peripherally continuous sealing engagement with said valve seat even when said probe is inserted into said passage in axially misaligned relation thereto.

3,866,639

TREE TRIMMING AND TRANSPORTING MACHINE

Mikko Kantola, Haukilahti, and Paavo Haataja, Rajamaki, both of Finland, assignors to Tyotehoseura R. Y., Helsinki, Finland

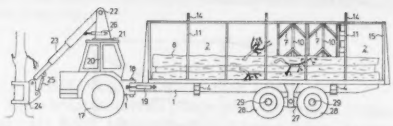
Filed Oct. 30, 1973, Ser. No. 411,062

Claims priority, application Finland, Nov. 2, 1972, 3072/72

Int. Cl. B27c *9/00*

U.S. Cl. 144—2 Z **4 Claims**

1. A mobile machine for simulaneously trimming and transporting trees, comprising a box-like load space adapted to collect a tree load, conveyors located at the bottom of said load space and on one vetical side thereof, means driving said conveyors, and stationary knife-like trimming blades located within said load space substantially parallel to said conveyors, said conveyors causing a displacement and mutual rubbing of



the trees in said load space and trimming them by their rotation against said blades.

3,866,640

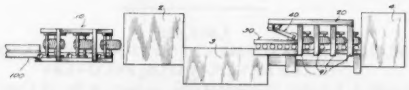
LOG FEEDING DEVICE

Harold J. Sweet, Rhinelander, and John G. Grimm, Jr., Tripoli, both of Wis., assignors to Marplex Products Co., Inc., Rhinelander, Wis.

Filed Dec. 26, 1972, Ser. No. 318,104

Int. Cl. B27c *9/04*

U.S. Cl. 144—3 R **20 Claims**



1. A device for centering moving logs or the like as they are fed into a sawing apparatus or the like, said device comprising: a supporting frame; at least one pair of generally oppositely disposed pivot arms, each pivotally mounted on said frame; a readily compressible, resilient roller for each said pivot arm, rotatably mounted on said pivot arm at a point spaced from the pivot point of said pivot arm whereby said readily compressible, resilient rollers are pivotable towards and away from one another; bias means operably connecting said pivot arm and said frame to thereby bias said rollers to pivotable movement towards one another whereby when a log passes between said rollers, said rollers compress individually and pivot away from one another to absorb irregularities in a log or the like while still holding said log or the like generally centered therebetween.

3,866,641

FLUID-OPERATED FASTENER FEEDING APPARATUS

Koichi Mizu; Koichi Kitani, and Yubi Mori, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 20, 1973, Ser. No. 399,136

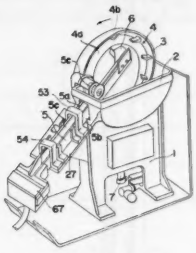
Claims priority, application Japan, Sept. 20, 1972, 47-94757; Sept. 20, 1972, 47-94758; Sept. 20, 1972, 47-94769

Int. Cl. B25b *23/00*

U.S. Cl. 144—32 **7 Claims**

1. In combination, a fluid-operated fastener feeding apparatus and a power operated fastening tool, said combination comprising a hopper adapted to contain therein a number of fasteners, a rotary drum rotatably mounted onto said apparatus and forming one side of said hopper, a fluid-operated drive mechanism for rotating said rotary drum, a track downwardly extending from said hopper for downwardly guiding a row of fasteners that has been supplied onto said track from the bottom of said hopper by said rotary drum, an escapement mounted on said track for successively separating the downwardly guided fasteners one at a time and feeding each fastener to said fastening tool, fluid-operated detection means located along said downward sloping track for detecting the presence and absence of fasteners on said track, a fluid signal generator attached to said fastening tool for generating a fluid signal whereby the feeding of fasteners from said escapement

assembly to said fastening tool is regulated, and a fluid control circuit to which is connected a fluid source for providing fluid power to operate said fastening tool, said fluid generator, and said escapement mechanism, for providing power to control said escapement mechanism by providing the fluid for the



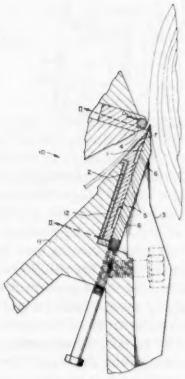
fluid signal generated by said fluid signal generator directed to said escapement mechanism, and further providing a source of fluid power to operate said fluid-operated drive mechanism in response to a fluid signal from said fluid-operated detection means, fluid for the signal generated by said fluid-operated detection means also being provided by said fluid source.

3,866,642

VENEER PEELING WITH FLUID INJECTION

Donald C. Walser, Surrey, B. C., Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Mar. 2, 1973, Ser. No. 337,562
Int. Cl. B27l *5/00*
U.S. Cl. 144—212 **4 Claims**



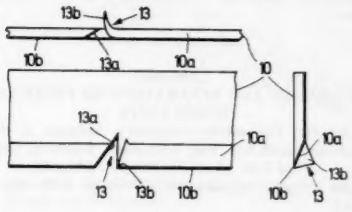
1. An apparatus for reducing surface roughness of veneer and the cutting forces in a veneer peeling apparatus having a cutting blade, means for supporting a wood piece and means for providing relative movement between the cutting blade and wood piece, the improvement comprising elongated chamber defining means extending substantially parallel with the cutting blade, inlet means for said chamber defining means and means for supplying pressurized steam thereto, and orifice means communicating with said chamber defining means disposed so as to direct steam generally towards the cutting edge of the blade.

3,866,643

KNIFE FOR A WOOD-SHAVING MACHINE

Karl Schaefer, 22 In der Lohe, Neu-Bamberg, Germany

Filed Mar. 22, 1973, Ser. No. 343,729
Claims priority, application Germany, Mar. 24, 1972, 2214434
Int. Cl. B27g *13/00*
U.S. Cl. 144—241 **10 Claims**



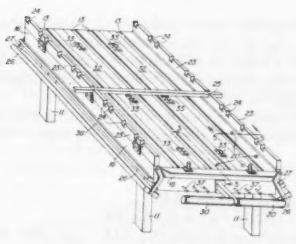
1. For use in a machine for cutting wood shavings and simultaneously dividing them into chips of predetermined length, a knife having a series of straight cutting edges situated along a common straight line, said knife having at least at one end of each of said straight cutting edges a transverse cutting portion separating a pair of successive straight cutting edges from each other, formed integrally with and extending transversely from an end of a straight cutting edge, and terminating distant therefrom in a relatively sharp, pointed cutting tip, said transverse cutting portions cutting transversely across shavings cut by said straight cutting edges to divide the shavings into chips of predetermined length.

3,866,644

WORK TABLE FOR FABRICATING PANEL STRUCTURES

Mayo P. Stubbs, P.O. Box 131, Colorado City, Ariz. 86021

Filed Apr. 2, 1973, Ser. No. 346,968
Int. Cl. B25h *1/02, 1/20, 7/00*
U.S. Cl. 144—288 C **9 Claims**



1. A work table for use in fabricating panel structures having an internal framework covered by panels, said table comprising a horizontal work area having changeable template means extending therealong; means for positioning top and bottom plate members of said framework on the work area in correct structural relationship to each other said positioning means comprising raised sections extending along the longitudinal sides and one end of said work area, said top and bottom plate members being positioned by placing the sides thereof in contact with the raised sections on the sides of said work area and the respective ends thereof in contact with the raised section on the end of said work area; and elongate jig members extending along at least two mutually opposite edges of the work area, said template means having a series of marks spaced along the length thereof, each mark indicating a particular type of framework element and the position thereof on

the work area, said jig members having a series of marks spaced along the length thereof, the individual marks corresponding to correct positions of respective framework elements in said panel to thereby indicate correct locations for nailing the panels to the framework, and said jig members being attached to the sides of said raised sections by hinges whereby said jig members can be rotated from a retracted position extending downward along the sides of said sections to a position extending vertically upward from said raised sections.

3,866,645

METHOD OF AND APPARATUS FOR PRODUCING WOOD CHIPS

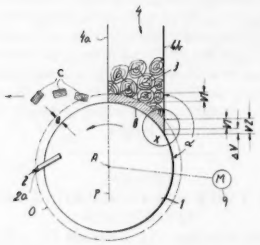
Hans Sybertz, Hargesheim, Germany, assignor to Hombak Maschinenfabrik KG, Bad Kreuznach, Sandweg, Germany

Filed Feb. 13, 1973, Ser. No. 332,108

Claims priority, application Germany, Feb. 19, 1972, 2207901

Int. Cl. B27c *9/00*

U.S. Cl. 144—326 C **10 Claims**



1. A method of reducing pieces of wood to chips comprising the steps of:

rotating an elongated cutter blade about an axis whereby the cutting edge of said blade defines an orbit;

feeding pieces of wood to said cutter in a column having a pair of sides, one of said sides forming a flatter angle with said orbit than the other of said sides; and

advancing said pieces of wood toward said cutter more rapidly at said one side than at said other side.

3,866,646

GOLF CLUB CARRIER

William Kenningale Nevard, Suite 505, 615 7 Ave., New Westminster, British Columbia, Canada

Filed Jan. 18, 1974, Ser. No. 434,504

Int. Cl. A63b *55/04*

U.S. Cl. 150—1.5 **5 Claims**

1. A golf club carrier comprising:

a a plurality of elongated tubes disposed in parallelism, each being adapted to receive the shaft of a golf club,

b a rigid spine extending substantially longitudinally of the tubes,

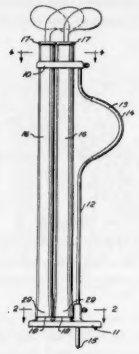
c a collar secured to the spine embracing the tubes adjacent the upper ends of the latter,

d a base plate assembly connected to the spine in a spaced relationship relative to the collar, the base plate assembly having:

i a plurality of projections over each one of which a lower end portion of a tube has a stretch fit,

ii a clamping yoke having a wedge fit between the lower end portions of the tubes,

iii a threaded connector engaging the base plate assembly



and the clamp for drawing the clamp into wedging engagement with said lower end portions of the tubes.

3,866,647

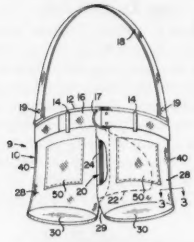
AMUSEMENT DEVICE

Janet Tarkowski, 4700 Wallace Ave., Tampa, Fla. 33611

Filed Dec. 14, 1972, Ser. No. 315,095

Int. Cl. A45c *3/06*

U.S. Cl. 150—30 **28 Claims**



1. An amusement device in the form of a novelty purse simulating a pair of pants, comprising a flexible pants-shaped body having an upper waist-like portion providing access to within the body, a pair of depending leg portions, and between said leg portions a crotch, means closing said leg portions for retaining articles within the body, carrying means connected with said body proximate said waist portion for carrying said body, and means retaining said waist-like portion generally expanded as viewed from the front of the pants-shaped body as said body is carried by said carrying means, the retaining means including belt straps along the waist-like portion and a belt between the body and the belt straps.

3,866,648

MICROFILM COPY JACKET

Thomas P. Anderson, Hubbard Woods, Ill., assignor to Microseal Corporation, Evanston, Ill.

Filed May 11, 1971, Ser. No. 142,213

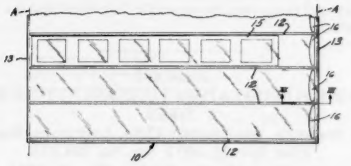
Int. Cl. A45c *11/18*

U.S. Cl. 150—39 **4 Claims**

1. A non-tearing multiple-pocket microfilm jacket having a pair of opposed generally parallel edges comprising:

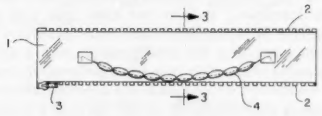
a pair of thin transparent plastic films, one overlying the other, said films being attached to one another by parallel longitudinally extending spaced bonding lines between

said films, said bonding lines being formed by fusion of said films to one another to define a plurality of elongated side-by-side film retaining pockets extending the length of said jackets to receive strips of photographic film, said bonding lines being generally perpenduclar to said edges, the thickness of the jacket along said bonding lines being less than the combined thicknesses of two unbonded plies



of the film, said plies being unattached between said bonding lines along at least one of said edges said bonding lines terminating at their ends inwardly of said edges to present a two-ply thickness along said edges thereby preventing tearing of the films along said bonding lines upon the placing and removal of microfilm therein or upon the application of manual handling forces on the jacket transverse to the bonding lines.

3,866,649
SHOPPING CART HANDLE COVER
William F. Bringmann, 49 Grove St., Waterbury, Conn. 06710
Filed Nov. 5, 1973, Ser. No. 392,686
Int. Cl. B62b *5/00, 9/26*
U.S. Cl. 150—52 R **2 Claims**



1. A removable cover for a shopping cart handle comprised of a sheet of flexible plastic cut to fit the handle, a zipper for binding the sheet of flexible plastic to the handle and a string of ornaments loosely attached to the outside of the sheet of flexible plastic.

3,866,650
INTERNAL LOCKING DEVICE
Artemas M. Larkin, Glendale, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Division of Ser. No. 94,696, Dec. 3, 1970, Pat. No. 3,736,010.
This application May 25, 1973, Ser. No. 364,193
Int. Cl. F16b *39/00*
U.S. Cl. 151—21 C **9 Claims**

1. An internal locking device actuable only by externally mounted elements therewith, comprising in combination:

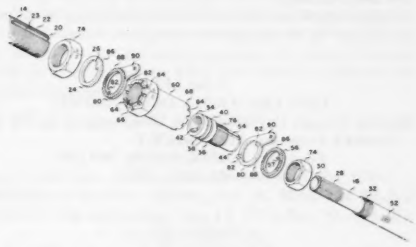
a threaded member;

a sleeve member having internal threads for cooperative engagement with said threaded member,

a plurality of annular grooves in adjacently spaced relation in said sleeve member and alternately on the interior and the exterior thereof; and

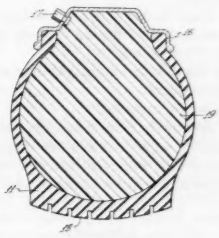
actuating means axially engaging said sleeve member on both ends thereof whereby generation of a force generally longitudinally-directed in said sleeve member compresses said grooves so as to provide a surface-to-surface contact between the threads of said sleeve member and said threaded member,

thereby making lockable the threads of the latter to the former and providing longitudinal adjustability without



exceeding the elastic limits of deformation of the material of said sleeve member.

3,866,651
FLAT FREE PNEUMATIC TIRE AND VOID FREE FILLING THEREFOR
Edward N. Gomberg, 14191 Livingston St., Tustin, Calif. 92680
Continuation-in-part of Ser. No. 397,940, Sept. 17, 1973,. This application Oct. 10, 1973, Ser. No. 404,856
Int. Cl. B60c *1/00*
U.S. Cl. 152—313 **16 Claims**



1. A flat-free pneumatic tire casing and an essentially void-free polyurethane elastomeric filling material confined, at least in part, by aaid casing, said elastomeric material being the product of the reaction of, in the essential absence of foam producing material in the reaction zone, a defined prepolymer and a defined other reactant, where

said prepolymer reactant is selected from the class consisting of

1. organic polyisocyanate and hydroxyl group terminated polyfunctional polyether, wherein essentially all the prepolymer terminal groups are isocyanate groups;
2. organic polyisocyanate and hydroxyl group terminated polyfunctional polyester, wherein essentially all the prepolymer terminal groups are isocyanate groups;
3. organic polyisocyanate and hydroxyl group terminated polyfunctional polyether wherein essentially all the prepolymer terminal groups are isocyanate groups which groups have been blocked to afford "isocyanate" reactivity only at elevated temperature; and
4. organic polyisocyanate and hydroxyl group terminated polyfunctional polyester wherein essentially all the prepolymer terminal groups are isocyanate groups which groups have been blocked to afford "isocyanate" reactivity only at elevated temperature;

said other reactant is hydroxyl group terminated polyfunctional polyether, in the case of said prepolymer (1) and said prepolymer (3) to obtain poly(ether)urethane elastomeric material;

said other reactant is hydroxyl group terminated polyfunctional polyester, in the case of said prepolymer (2) and said prepolymer (4) to obtain poly(ester)urethane elastomeric material;

said polyurethane elastomeric material being characterized in part by an essential freedom from voids.

3,866,652

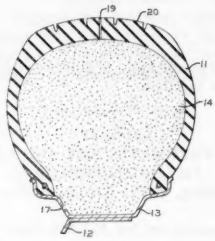
TIRE AND WHEEL COMBINATION

Shamim Ahmad, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,736

Int. Cl. B60c *7/12*

U.S. Cl. 152—317 **6 Claims**



1. An assembly comprising:

a. pneumatic tire;

b. a vehicle wheel having a tire-mounting rim with said tire mounted on said rim forming a cavity between the interior of the tire and rim; and,

c. said cavity filled with a solid, resilient composition comprising a mixture of:

1. an elastomeric material;

2. hollow spheres having diameters ranging from 10 to 300 microns, with said spheres dispersed throughout the elastomeric material and the elastomer cured, thereby forming a solid filling of said cavity.

3,866,653

FLAPS FOR TIRES

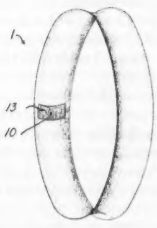
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cil, Clermont-Ferrand, France

Filed Mar. 23, 1973, Ser. No. 344,424

Claims priority, application France, Mar. 31, 1972, 72.11709

Int. Cl. B60c *21/04*

U.S. Cl. 152—365 **3 Claims**



1. In a tire flap having an increased thickness of material around the valve hole and a reinforcement in that region, the improvement which comprises said reinforcement being constituted of

a. a rigid tubular insert which forms the wall of the valve hole through the flap, except in the vicinity of the radially outer surface of the flap, said tubular insert having two collars, the first collar being embedded in the increased thickness of the flap and spaced from the radially outer surface of the flap and the second collar forming the radially inner surface of the flap around the valve hole, and

b. a layer of reinforced elastomer which forms a covering of the radially inner surface of the flap all around the insert, said layer being formed of a rubberized cloth glued to the flap and interposed between the flap itself and the second collar.

3,866,654

DEVICE FOR INFLATING TUBELESS AUTOMOBILE TIRES

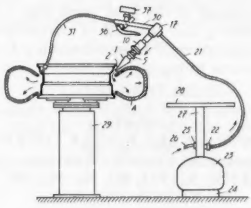
Victor Duquesne, Quellinstraat 42-44, Antwerpen, Belgium

Filed Nov. 22, 1972, Ser. No. 308,813

Claims priority, application Belgium, Nov. 30, 1971, 51485; Feb. 14, 1972, 51662

Int. Cl. B60c *29/12*

U.S. Cl. 157—1.1 **1 Claim**



1. A device for inflating tubeless pneumatic tires on valved wheel rims comprising at least one open end tube shaped injection nozzle of which one open end constitutes an air outlet mouth piece of a flat configuration with a divergent bore and capable of insertion between a deflated tire bead and the rim of a wheel on which said tire is mounted and to inject a large quantity of compressed air into the tire, a compressed air feed hose, a source of compressed air being connected to said air feed hose, a main valve to which the other end of said nozzle is secured, said main valve being provided for the rapid controlling of the flow of air to said nozzle, an extension piece secured to said main valve and said air feed hose, an outlet pipe mounted on said extension piece and being in open communication therethrough with said feed hose, said outlet pipe extending obiquely towards said main valve and serving as a handle, an inflation valve in said outlet pipe, an inflation hose connected to said inflation valve, and a fitting on said air inflation hose being capable of connection to the wheel rim valve.

3,866,655

TIRE CHANGER WITH IMPROVED TIRE CHANGING TOOL

Jimmie L. Holladay, Antioch, Tenn., assignor to The Coats Company, Inc., LaVergne, Tenn.

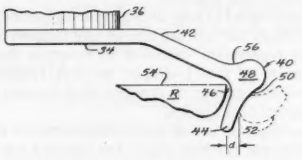
Filed June 25, 1973, Ser. No. 373,490

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.24 **1 Claim**

1. In a tire changing apparatus including a rotatable table on which a rim may be placed for rotation therewith for mounting or demounting a tire on the rim, a structure adjacent the table mounting extendable elements above the table including a tool haaving a tool head adapted to be brought in close proximity to the upper edge of a rim on the table for guiding the bead of a tire during a mounting or demounting operation, the improvement in said tool head comprising: a member having a downwardly extending projection, said projection also ex-

tending inwardly toward said table and defining a concave area in which the upper edge of a rim may be received, said downwardly extending projection including tire bead guiding recesses on opposite sides thereof, and an upper, outwardly extending, bulbous portion under which the bead of a tire to be mounted may be received and located so that the bead of the tire will be located below the upper edge of a rim on the table whereby the circumference of the bead of the tire need not be stretched during a mounting operation and whereby a



portion of the tire bead opposite that in engagement with said tool need not be located on the dropped center of a rim on said table so that the force required to locate said table during a tire mounting operation is minimized, said downwardly extending projection further including a rounded surface remote from said table, and further including an additional concave area on the upper side of said bulbous portion and adjacent said table for receiving and guiding the bead of a tire during a tire demounting operation.

3,866,656

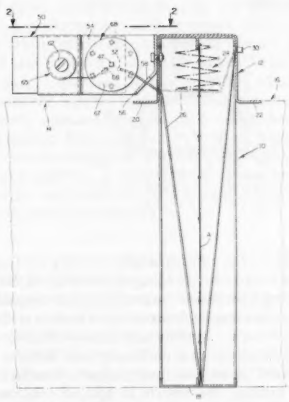
FOLDING BLADE FIRE DAMPER

Francis J. McCabe, P. O. Box 181, Buckingham, Pa. 18912

Continuation-in-part of Ser. No. 293,460, Sept. 29, 1972, Pat. No. 3,796,249. This application May 3, 1973, Ser. No. 357,000

Int. Cl. E05f *15/20*; **E06b** *9/204*

U.S. Cl. 160—84 **5 Claims**



1. In a damper having blades movable between a folded and unfolded condition and having a motor operated means connected thereto to move said blades to said folded condition, the improvement comprising: drive means directly connected to the motor operated means to drive said motor operated means in a reverse direction to the movement of said means when folding said blades, said motor operated means comprising a motor and gear train system, said drive means being directly connected to said gear train system to overcome the frictional resistance of that gear train system to allowing the blades to move to an unfolded condition, said motor operated means having a spool connected to a flexible member disposed about said blades to move said blades to a folded condition upon rotation of said spool in one direction, said drive means being directly connected to said spool to rotate said spool in the opposite direction, and wherein the blades create a tension in said flexible member which is resisted by the frictional forces of said gear train system, and wherein said drive means rotates said spool to reduce the tension in said flexible member to thereby allow said blades to move to an unfolded condition.

3,866,657

FIRE DAMPER

Francis J. McCabe, Hollow Horn Rd., Erwinna, Pa. 18902

Division of Ser. No. 192,006, Oct. 26, 1971, Pat. No. 3,814,165. This application Sept. 12, 1973, Ser. No. 396,392

Int. Cl. E05d *7/10*

U.S. Cl. 160—181 **2 Claims**

1. In a fire damper having a frame and a plurality of blades interconnected for movement between a folded and unfolded condition, the improvement comprising: support means integral with said frame for retaining, supporting and permitting articulation of one of said blades, said blade being z-shaped and including a web portion; said support means comprising a plurality of flanges extending inwardly from opposite sides of said frame, each of said flanges being notched in a manner creating a tab, said notches receiving said web portion.

3,866,658

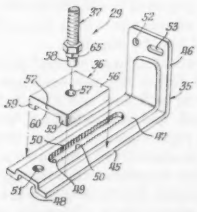
PIVOTAL SUPPORT AND GUIDE HARDWARE FOR FOLDING DOORS

Lester L. Smith, 230 W. Monroe St., Suite 2040, Tucson, Ariz. 60606

Filed Jan. 28, 1974, Ser. No. 436,961

Int. Cl. E05d *15/26*

U.S. Cl. 160—206 **13 Claims**



1. A hardware assembly for pivotally supporting hingedly interconnected folding door panels mounted in a door opening defined by an overhead horizontal lintel, a pair of vertical

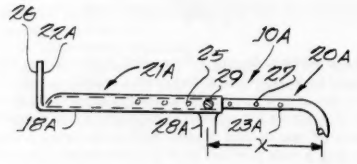
side jamb members and a floor, comprising: an elongated track mountable on and beneath the lintel and having a lengthwise extending guide slot opening inwardly of the lower face thereof; an upper pivot block mountable within said track and having a pivot socket therein communicating with said guide slot and means for anchoring said upper pivot block at selected locations along said track laterally inward of one of said jamb members, a lower pivot block having a second pivot socket formed inwardly of its upper face, a lower pivot bracket having an elongated floor engaging arm provided with means for attaching said bracket to the floor and having an elongated central opening, plural serrated teeth formed along and extending inwardly of the lengthwise opposing edges of said opening, said lower pivot block having an anchor portion depending from and beneath a bottom face thereof for insertion into said elongated opening, said anchor portion having serrated teeth matingly engageable with the serrated teeth of said elongated opening whereby said lower pivot block is positively connected to said floor engaging arm at selected locations along the length thereof, said anchor portion being positioned adjacent one end of said lower pivot block and off center with respect to said second pivot socket therein whereby the same is reversibly positionable in said elongated opening to provide a dual range of positions for interconnecting said lower pivot block with said floor engaging arm.

3,866,659

DRAPERY TIE BACK DEVICE

Floyd Kaminski, 8327 S. Kedvale, Chicago, Ill. 60652

Filed July 19, 1973, Ser. No. 380,576
Int. Cl. A47h *1/00*
U.S. Cl. 160—349 D **3 Claims**



1. A drapery tie-back device for use with a flexible tie-back cord for a drape to support the drapery in folds to one side of an opening, such as a window opening, with the flexible tie-back cord passed thereabout and with the drapery pleats projecting in spaced relationship to the surrounding wall, the device comprising, in combination:

a generally U-shaped member having a pair of parallel support arms connected by a bight forming cross member at one end thereof and extending normal thereto;

a cross bar connected between said support arms at a location offset inwardly from said cross member and extending parallel to said cross member;

an opening provided in said cross bar adapted to receive a split-ring element to which one end of the flexible tie-back cord may be attached;

a pair of identical separate bracket members each having an elongated hollow leg member open at its front end and closed at its back end with a mounting ear affixed to the closed back end and extending forwardly therefrom at generally right angles to the axis of said leg member;

said brackets adapted to be mounted to a wall within an end pleat of the draperies with said mounting ear projecting in an opposite direction from each other and with the brackets spaced apart a distance corresponding to the spacing between said support arms of said U-shaped member;

said support arms of said U-shaped member adapted to be telescopically received for sliding movement in associated ones of said leg members such that the cross member is movable selectively as to its distance from said mounting ears;

a series of longitudinally spaced apart and aligned openings extending along each of said support arms from the cross member to the terminal end thereof;

an opening disposed in each of said leg members of said bracket adjacent the top open end thereof and oriented therethrough in a manner to be brought into selective registration with selected ones of said openings in said support arms when said support arms are telescopically received in said brackets;

pin means adapted to pass through said leg member opening and through the selected one of said support arm openings in registration therewith to maintain the selected adjustment of said U-shaped member relative to said bracket in a manner to accommodate a variety of pleat thicknesses of draperies;

apertures disposed in said leg members adapted for receipt of a split-ring to which one end of said tie-back cord may be secured so that the cord may be selectively attached to positions on said bracket leg members;

the mounting ears of said bracket extending at generally right angles to said leg members to provide planar mounting surfaces for engagement with said drapery wall;

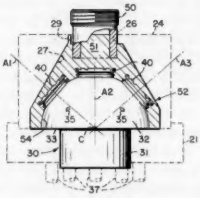
said cross member adapted to be disposed within a pleat of said drapery with said distance between said cross member and said mounting ears being adjusted to provide sufficient space to accommodate varying widths of pleats of said drape with a minimum of crushing of said drape pleats in a direction toward said wall by said tie-back cord.

3,866,660

METHOD FOR PRODUCING A LENS BLOCKING TOOL

Charles L. Gill, Dresden, N.Y., assignor to Harris, Beach & Wilcox, Rochester, N.Y. and Angelo Pelino, Rochester, N.Y., a part interest to each.

Filed Dec. 1, 1972, Ser. No. 311,399
Int. Cl. B29d *19/06, 3/00*
U.S. Cl. 164—108 **5 Claims**



1. The method of producing a lens blocking tool containing a plurality of inserts for holding a plurality of lens blanks during surfacing operations on the blanks, comprising

providing a plurality of inserts, each having in one end a circular recess for holding a single lens blank,

mounting said inserts in a mold cavity so that the recessed ends thereof lie on a common spherical surface,

releasably holding the inserts in spaced relation on said spherical surface with a circumferential surface on the recessed end of each insert having line contact with said spherical surface, whereby the recesses in said inserts are closed by said spherical surface and have their axes automatically positioned to extend through the center of curvature of said spherical surface, and

filling the cavity with a fluid molding material to mold a tool body around said inserts and against the spherical surface between said inserts to form a molded tool in which the inserts are embedded with their circular recesses opening on a spherical surface, which is formed on the tool by the first-named spherical surface, whereby when the molded

tool is withdrawn from the cavity a lens blank may be mounted in each of the circular recesses that open on the tool surface.

3,866,661

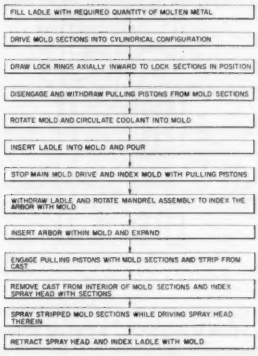
HORIZONTAL CENTRIFUGAL CASTING METHOD

Frederick William Baumann, Scotia; Bernard Ceasar Kaczkowski, Schenectady; George Mowry Rosenberry, Jr., Elnora, N.Y., and William Russell Smith, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 277,920, Aug. 4, 1972, Pat. No. 3,825,057. This application Feb. 26, 1974, Ser. No. 446,054

Int. Cl. B22d *13/10*

U.S. Cl. 164—114 **3 Claims**


FILL LADLE WITH REQUIRED QUANTITY OF MOLTEN METAL
DRIVE MOLD SECTIONS INTO CYLINDRICAL CONFIGURATION
DRAW LOCK RINGS AXIALLY INWARD TO LOCK SECTIONS IN POSITION
DISENGAGE AND WITHDRAW PULLING PISTONS FROM MOLD SECTIONS
ROTATE MOLD AND CIRCULATE COOLANT INTO MOLD
INSERT LADLE INTO MOLD AND POUR
STOP MAIN MOLD DRIVE AND INDEX MOLD WITH PULLING PISTONS
WITHDRAW LADLE AND ROTATE MANDREL ASSEMBLY TO INDEX THE ARBOR WITH MOLD
INSERT ARBOR WITHIN MOLD AND EXPAND
ENGAGE PULLING PISTONS WITH MOLD SECTIONS AND STRIP FROM CAST
REMOVE CAST FROM INTERIOR OF MOLD SECTIONS AND INDEX SPRAY HEAD WITH SECTIONS
SPRAY STRIPPED MOLD SECTIONS WHILE DRIVING SPRAY HEAD THEREIN
RETRACT SPRAY HEAD AND INDEX LADLE WITH MOLD

1. A method of centrifugally casting finned cylindrical structures comprising juxtaposing a plurality of arcuate sections to form a horizontally disposed cylindrical mold, rotating said mold at a predetermined speed, pouring molten material into said mold to centrifugally cast said finned cylindrical structure, registering said cast structure with a horizontally disposed arbor, obtaining relative movement between said arbor and said cylindrical structure to insert said arbor within said structure, expanding at least a portion of said arbor into contact with the interior surface of said cast structure, applying a radially outward force to each said arcuate section to strip said section from said cast cylindrical structure, removing said cast structure from the interior of said stripped mold sections and applying a radially inward force to said sections to reassemble said horizontally disposed cylindrical mold for casting a subsequent structure.

3,866,662

METHOD OF CASTING QUIET STEEL IN MOLDS

Robert Klages, Dortmund, and Heinrich Kleeschulte, Dortmund-Barop, both of Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Germany

Filed Nov. 15, 1972, Ser. No. 306,715

Claims priority, application Germany, Nov. 16, 1971, 2156768

Int. Cl. B22d *27/04*

U.S. Cl. 164—123 **12 Claims**

11. A method of casting quiet steel in a mold which includes:

1. introducing molten steel to be cast into the bottom of the mold to fill the mold;
2. adding carbon-free casting powder on the upper surface of the molten steel when it reaches a level intermediate the top and bottom of the mold;
3. when the steel reaches the desired top level in the mold, instantaneously and completely discharging water on to the liquid slag layer covering the steel, thereby causing the slag layer to solidify and separate from the steel, so that the latter is contacted by the water.

3,866,663

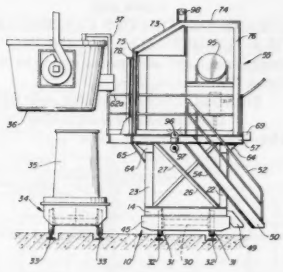
MOBILE PERSONNEL CAR FOR INGOT POURING OPERATIONS

Leland H. Hutton, 2815 Claver Rd., University Heights, Ohio 44118

Filed Feb. 7, 1973, Ser. No. 330,254

Int. Cl. B22c *19/04*; **B22d** *41/12*; **B66c** *6/00*

U.S. Cl. 164—155 **13 Claims**



1. The combination with a car having ingot molds to be filled from a ladle containing molten metal, said car being movable on rails, a mobile personnel car from which the pouring of metal into the molds is controlled, said personnel car being movable on rails independent of said first-named rails in a direction parallel with said first-named rails, said personnel car comprising a lower unit and an upper unit, each having a platform, said upper unit having a side at least partially closed and disposed adjacent said ingot molds and having partially closed ends extending from said side, said ends having openings therein adjacent said side for egress of personnel from the upper unit, said lower unit having stairways mounted at its ends and leading from said openings to points immediately rearwardly of said personnel car and adjacent ground level, said stairways disposed in planes substantially parallel with the ends of said lower unit and inclined in a direction away from said ingot molds, said stairways having guard plates provided therebelow for preventing molten metal from splashing upward therethrough.

3,866,664

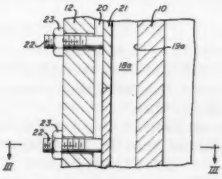
MOLD FOR USE IN CONTINUOUS-CASTING OF METALS

Paul M. Auman, Franklin Township, Westmoreland County; John E. Bower, Jr., Monroeville Borough, Allegheny County, and Hugh E. Pry, North Huntingdon Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed June 1, 1973, Ser. No. 365,872

Int. Cl. B22d *11/00*

U.S. Cl. 164—283 M **6 Claims**



1. In a continuous-casting mold which includes an open-ended liner of heat conductive metal, and backup plates fas-

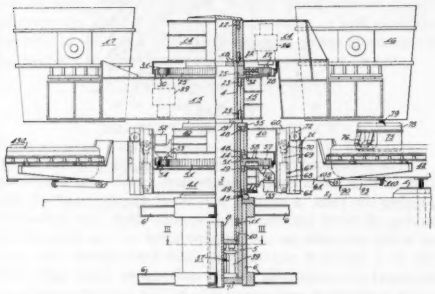
tened to the outside faces of said liner, said liner having a series of vertical ribs in its outside faces defining with said backup plates a plurality of parallel unobstructed water-circulation passages, the combination therewith of improved means fastening said backup plates to said liner, said means comprising opposed laterally directed lips formed on certain of said ribs, metal strips inserted in these passages under said lips, the latter ribs defining with said strips additional unobstructed water-circulation passages, studs fixed to said strips and extending through said backup plates, and nuts threadedly engaged with said studs outside said backup plates.

3,866,665

TWIN STRAND CONTINUOUS CASTING APPARATUS WITH A TUNDISH LOAD BALANCING VESSEL

Rudolf Schoffmann, Linz, Austria, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 2, 1974, Ser. No. 430,032
Int. Cl. B22d *11/10, 37/00*
U.S. Cl. 164—281 **8 Claims**



1. A twin strand continuous metal casting apparatus comprising:

a. two casting molds spaced apart in a common horizontal plane;

b. a vertical arbor assembly horizontally spaced from both molds;

c. a tundish carrier assembly mounted on the arbor for pivotal movement in a horizontal plane above the molds, said assembly having a hub around the arbor and a pair of forks projecting radially outward from the hub in a common horizontal plane;

d. a plurality of tundishes, with one tundish mounted on each fork;

e. a tiltable tundish loading vessel having a pair of discharge spouts projecting from opposite sides of the vessel;

f. vessel supporting means connected between said forks and carrying the tundish loading vessel transversely above the forks with each of the spouts over one of the tundishes; and

g. ladle supporting means adapted to carry a ladle containing molten metal and operative to move a ladle of molten metal into a teeming position over the tundish loading vessel to discharge metal thereto for selective flow through both said spouts to both said tundishes.

3,866,666

DIE CASTING APPARATUS

William G. Wunder, Hamilton, Mich., assignor to Prince Corporation, Holland, Mich.

Division of Ser. No. 294,523, Oct. 3, 1972, Pat. No. 3,826,302.
This application Mar. 20, 1974, Ser. No. 452,961
Int. Cl. B22d *17/04*
U.S. Cl. 164—327 **7 Claims**

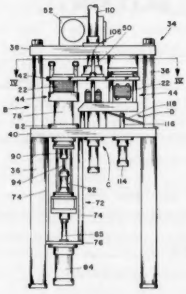
1. Die casting apparatus comprising:

a framework having an upper supporting surface and a lower supporting surface having a plurality of stations;

indexing means rotatably supported on said upper support surface;

a plurality of molds having upper and lower mold cavity die sections mounted on said indexing means for sequential movement through a plurality of stations, said lower die section of each of said plurality of molds being mounted for vertical movement with respect to said upper die section and having gate means therein for the entrance of molten, metallic material into said cavities;

charging means for said mold mounted on said lower support surface, said charging means including a shot sleeve and a piston movable axially in said sleeve;



said indexing means at one of said stations supporting a mold in vertical alignment with said charging means;

means for moving said shot sleeve into communicating relationship with said lower die member and for shifting said lower die member into clamping engagement with said upper die member;

means for driving said piston through said shot sleeve to thereby force the molten material therein through said gate means into said mold cavity; and

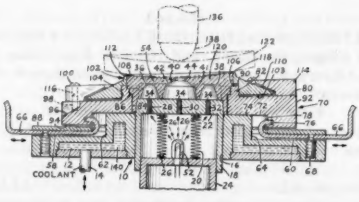
means for rotating said indexing means to sequentially position each of said moldss in charge-receiving position over said charging means.

3,866,667

LENS BLOCKING DEVICE

Lloyd F. Knight, Belleair Beach, Fla., assignor to Textron, Inc., Tampa, Fla.

Filed Dec. 10, 1973, Ser. No. 423,448
Int. Cl. B22d *17/24, 19/00*
U.S. Cl. 164—334 **7 Claims**



1. A lens blocking device comprising

a pair of wedge-shaped prism rings, one of which is rotatably adjustable relative to the other about the axis of said one of said rings,

said rings having contiguous plane faces which are inclined with respect to the axis of said one of said rings,

means for holding said rings in axial alignment and in rotatable contact with one another,

indicia on each of said rings for selecting a predetermined amount of prism in diopters by rotating said rings relative to each other,
a base,
means for holding said one of said rings in axial alignment and in rotatable contact with said base,
indicia on said base for selecting a predetermined prism axis by rotating said rings relative to said base,
means on the distal face of the other of said rings for engaging the surface of a lens blank to be blocked,
said rings, base and lens blank surface defining a cavity shaped to form a lens block,
and means for supplying molten metal to said cavity for molding said lens block in said cavity and adhering it to said lens blank, whereby a predetermined amount of prism in diopters and a predetermined meridianal orientation of said prism may be incorporated into siad lens block.

3,866,668

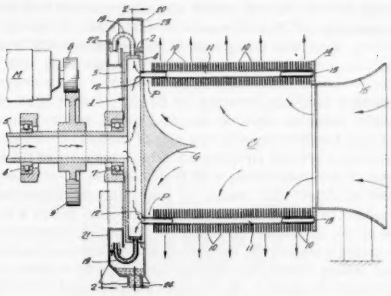
METHOD OF HEAT EXCHANGE USING ROTARY HEAT EXCHANGER

William A. Doerner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 110,478, Jan. 28, 1971, , which is a continuation-in-part of Ser. No. 25,857, April 4, 1970, abandoned. This application Nov. 17, 1972, Ser. No. 307,612

Int. Cl. F28d *11/04*; **F28f** *5/00*

U.S. Cl. 165—1 **2 Claims**



1. In rotary heat exchange apparatus comprising
an array of a plurality of annular fins disposed coaxially in predetermined spaced parallel relation for rotation as a unit about a common axis, each fin having the same inner radius and the same outer radius and a predetermined inner to outer radii ratio in the range of 0.70 to 0.85,
a plurality of heat exchange tubes each extending longitudinally through said fins in spaced relation to the common axis and arranged circumferentially thereabout,
means for introducing a gaseous first fluid interiorly of said array of annular fins,
means for introducing and withdrawing a second fluid into and from said heat exchange tubes,
and means for rotationally driving said plurality of fins about said common axis,
the improvement which comprises rotationally driving the plurality of fins at a predetermined speed of rotation correlated to the axial spacing of said fins and the kinematic viscosity of said gaseous first fluid to provide a Taylor number in the range of 5.0 to 10.0 and operable at said inner and outer radii ratio of the fins to convey and accelerate said gaseous first fluid by viscosity shear forces spirally outward between the fins substantially to the velocity providing optimum heat exchange between the gaseous first fluid and the second fluid in said heat exchange tubes.

3,866,669

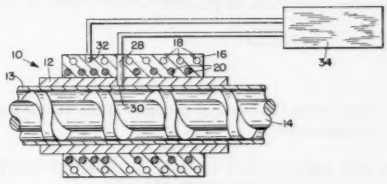
EXTRUDER AND TEMPERATURE CONTROL APPARATUS THEREFOR

Robert A. Gardiner, Westerly, R.I., assignor to Crompton & Knowles Corporation, New York, N.Y.

Continuation of Ser. No. 314,887, Dec. 13, 1972, abandoned. This application Nov. 29, 1973, Ser. No. 420,129

Int. Cl. F28f *27/02*

U.S. Cl. 165—27 **8 Claims**



1. An extruder having an extruder barrel and temperature control apparatus comprising:
a. a shell surrounding at least a portion of an extruder barrel, said shell being made of a material having a substantially higher thermal conductivity than said barrel, said shell having a total heat capacity of between 0.5 and 1.5 times that of said barrel portion;
b. means for cooling said shell;
c. means for heating said shell;
d. a first temperature probe set into said extruder barrel for sensing the temperature of said barrel and providing a proportional current;
e. a second temperature probe set into said shell for sensing the temperature of said shell and providing a proportional electrical current;
f. an electrical temperature control unit connected to said first and second probes and effective to selectively activate said heating and cooling means in response to the electrical currents from said first and second probes; and
g. means for weighting the temperature probe current from said barrel to a greater extent than the temperature probe current from said shell.

3,866,670

TUBE BUNDLE CABLE

Christoph Cramer; Hans-Martin Schmidtchen; Hans Jurgen Schwartze, all of Osnabrueck, and Bernd Eichmeyer, Lechtingen, all of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Continuation of Ser. No. 10,502, Feb. 11, 1970, abandoned. This application Mar. 9, 1972, Ser. No. 233,157

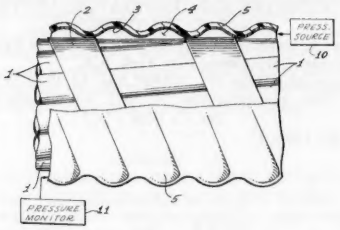
Claims priority, application Germany, Feb. 22, 1969, 1908993

Int. Cl. F24b *3/00*

U.S. Cl. 165—47 **12 Claims**

1. Conduit structure for a plurality of different fluids, at least some of them being pressurized, comprising:
a plurality of individual tubes disposed in relation to each other to form a cable bundle;
a longitudinally bent and longitudinally seam welded tape establishing a tubular jacket around the tubes, the jacket being pressure proof by virtue of the longitudinal seam welding and having helical corrugation which defines helical channels inside of the jacket; and
fluid maintained in the helically corrugated jacket and flowing in and along the helical channels inside of the jacket but in helical, circumscribing flow as to the bundle,

for uniformly providing the fluid in heat exchange contact with the bundle from the periphery thereof to obtain



temperature isolation of the tubes of the bundle from the environment.

3,866,671

CONVECTORS AND TO SYSTEM EMPLOYING SAME

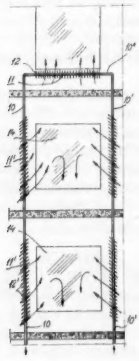
Sven Runo Vilhelm Gebelius, Fridhemsgatan 27, 112 40 Stockholm K, Sweden

Filed Feb. 28, 1972, Ser. No. 229,701

Claims priority, application Sweden, Mar. 26, 1971, 3949/71

Int. Cl. F24f *3/00*

U.S. Cl. 165—50 **3 Claims**



1. An air conditioning system for an enclosure comprising:

a. a looped pipe extending along an apertured wall of the enclosure in which heat exchange medium flows in a circuit to and from a temperature regulating unit;

b. an air ventilating shaft for passing a current of ambient air along said wall and into said enclosure;

c. said ventilating shaft being arranged in heat exchange relationship with the return loop of said pipe to precondition the air prior to being passed into the enclosure;

d. said pipe being provided with one set of inclined convector fins for directing conditioned air upwardly through the apertured wall into the enclosure and with oppositely inclined convector fins for directing the ambient air downwardly through said ventilating shaft.

3,866,672

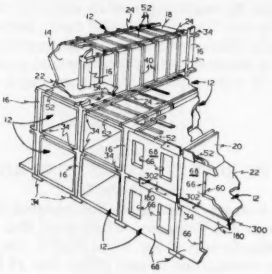
BUILDING

Frank D. Rich, Jr., Darien, and Alexander D. McDonald, Glenbrook, both of Conn., assignors to F. D. Rich Housing Corporation, Stamford, Conn.

Division of Ser. No. 163,274, July 16, 1971, Pat. No. 3,750,366, which is a continuation-in-part of Ser. No. 4,156, Jan. 19, 1970, abandoned. This application Apr. 27, 1973, Ser. No. 355,064

Int. Cl. F24f *3/00*

U.S. Cl. 165—50 **18 Claims**



1. A building with a hypocaust type of radiant heating and/or cooling system; comprising: a plurality of columns; a plurality of box modules each enclosing interior building space which is to be heated and/or cooled; means on said columns supporting said modules; said modules each being formed of ceiling, floor and wall plates fabricated separately from said building columns and each having a relatively thin cross-section dimension compared to the interior space enclosed by said box modules, whereby to be an efficient heat radiator and/or radiation absorber for said space; said columns separating a horizontally adjacent pair of modules to define therebetween a vertical air chase covering a majority of the surface area of the confronting wall plates of said horizontally adjacent modules; said means on said columns supporting said modules in vertically spaced relationship to define a horizontal air plenum between a pair of vertically adjacent modules covering a majority of the surface area of the confronting floor and ceiling plates thereof; ribs on the outer surface areas of said module plates, said ribs on adjacent modules not contacting one another, at least some of said horizontal plenums and vertical chases adjacent surfaces of said modules being in communication with each other to form one or more air jackets at least partially surrounding individual modules; a heating and/or cooling plant connected for delivering heated and/or cooled air into said air jackets whereby to be in heat-exchange relationship with said module wall, ceiling and/or floor plates; and means providing an air outlet from said air jackets.

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HEAT EXCHANGER FOR COOLING ORE CINDERS

Anatoly Petrovich Pavlov, prospekt Veteranov 35, kv. 39; Vladimir Matveevich Bogomolov, Ligovsky prospekt 63, kv. 19; Felix Borisovich Kupershmidt, ulitsa Radischeva, 32, kv. 44, all of Leningrad; Igor Afanasievich Nechitailo, ulitsa Akademika Pavlova, 25, kv. 17, Gorlovka Donetskoi oblasti; Nikolai Nikolaevich Nosilov, ulitsa Sofii Perovskoi, 3, kv. 4, and Isaak Zalmanovich Levin-Kogan, ulitsa B. Porokhovskaya, 45, kv. 265, both of Leningrad, all of U.S.S.R.

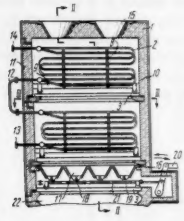
Filed Oct. 16, 1973, Ser. No. 406,922

Int. Cl. F24h *3/02*

U.S. Cl. 165—120 **1 Claim**

1. A heat exchanger for cooling lumpy material, particularly ore cinders, comprising a housing having an upper portion and a bottom portion; tubular sections located horizontally one above the other in said housing and adapted for passing cool-

ing water; adapters successively connecting said sections to each other; said heat exchanger housing having charging openings in its upper portion; said bottom portion being provided with slot-shaped holes parallel to each other and having their cross section shaped as trapeziums having their smaller base facing downwardly; a perforated plate reciprocably



mounted underneath said bottom portion of the heat exchanger being capable of reciprocating motion in a direction perpendicular to the holes in the bottom portion; a strip installed along each hole in said bottom portion and protruding beyond the lower edge thereof and serving for directing the material being cooled to the holes in said perforated plate, when the latter is moving.

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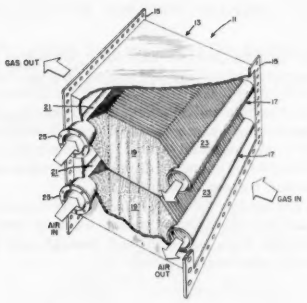
GAS TURBINE REGENERATOR

Salvatore S. Tramuta; James G. Miller; Howard M. Adriance, and Robert W. Barta, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,261
Int. Cl. F28f *3/12*
U.S. Cl. 165—166 **3 Claims**



1. A heat exchange section for passing a high pressure air flow in a heat exchange relation with a high temperature gas flow comprising:

a tubular inlet and outlet plenum disposed in said housing, said tubular plenums having at least one open end for receiving and discharging said high pressure air flow, a plurality of axially spaced, circumferentially elongated slots formed in said inlet and outlet plenums, said plenums disposed in spaced, generally parallel relationship with the slots of one plenum generally facing and axially aligned with the slots of the other plenum;

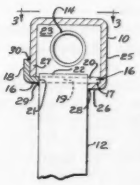
a plurality of discrete high pressure air passage means for directing high pressure air flow from said inlet plenum to said outlet plenum and for transferring heat thereto from said high temperature gas flow passing through said housing, said means extending between and interconnecting said inlet and outlet plenums and arranged in generally spaced parallel relationship and in generally parallel flow relationship to said gas flow with each said means comprising a pair of closely spaced generally parallel plates joined together at their peripheral edges so as to define an air passageway therebetween and formed with an open slot at opposite ends for flow into and out of said air passageway, each said passage means having one open end inserted into a slot of one plenum and joined thereto and the other open end inserted into the corresponding axial slot of the other plenum and joined thereto so as to form a gas passageway between each pair of high pressure passage means, whereby said passage means are connected to each other through and supported exclusively by said tubular plenums so as to permit removal and replacement of an individual one of said passage means and to reduce thermal stressing of said passage means.

3,866,675

METHOD OF MAKING A HEAT EXCHANGER AND A HEAT EXCHANGER

Melvin C. Bardon, and Norman G. Bauernfeind, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Aug. 3, 1973, Ser. No. 385,536
Int. Cl. F28d *7/06;* **B23p** *15/26*
U.S. Cl. 165—173 **6 Claims**



2. The heat exchanger of claim **1** wherein said other plate edge portion is shaped to provide a flange which is positioned to overlap said opposite tank edge portion and said one tank edge portion is shaped to provide a flange which is positioned over said slots at their open ends to abut against said tubes.

3. The method of making a heat exchanger having a tank and spaced tubes, comprising: providing a header plate having a pair of opposite side edge portions with spaced slots extending inwardly from one plate edge portion to short of the other plate edge portion, each slot having an open end at said one plate edge portion; providing a plurality of fluid flow tubes each having a tube end; positioning a tube end snugly in each said slot; positioning a metal tank part sheet having opposite edge portions on said header plate to enclose said tube end with one tank edge portion covering and closing said slot open ends and the other tank edge portion contacting said other plate edge portion, the intermediate portion of said tank part sheet between said edge portions being spaced from said tube ends to define a fluid tank means with said header plate; and joining together said tube ends, said tank edge portions and said header plate.

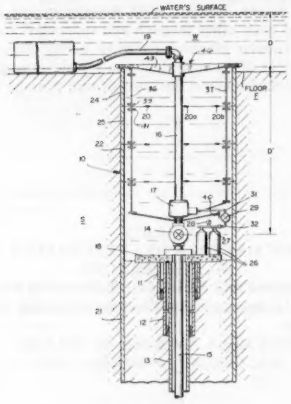
5. The method of claim **3** wherein said one tank edge portion is shaped to provide a flange which is positioned over said slots at their open ends to abut against said tubes.

3,866,676

PROTECTIVE STRUCTURE FOR SUBMERGED WELLS

Robert B. Burns, Long Island, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Filed May 23, 1973, Ser. No. 363,289
Int. Cl. E21b 43/01
U.S. Cl. 166—.5 10 Claims



1. Well structure for a hydrocarbon fluid producing well submerged beneath a body of water subject to moving ice masses and other floating objects which might scour the substrate, said well including;

a flow line embedded into said substrate beneath said body of water to conduct hydrocarbon fluid from a subterranean reservoir,

a caisson surrounding the upper end of said flow line, extending downwardly into the substrate from the surface of the latter, and defining a cavity,

flow control means connected into said flow line, being operable to regulate the fluid passage through the latter, and being disposed at the floor of said cavity a predetermined distance to avoid contact with substrate scouring ice masses,

said flow control means including a remotely operated flow shut off means, and a trigger mechanism connected to said caisson and to said flow shut off means respectively, whereby to actuate the latter and discontinue said fluid flow at such time as said caisson is damaged by scouring action of a moving ice mass.

3,866,677

UNDERWATER CONNECTION APPARATUS

Benton F. Baugh, Houston, Tex., assignor to Vetco-Offshore, Inc., Houston, Tex.

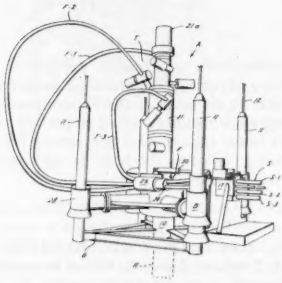
Filed Aug. 7, 1973, Ser. No. 386,431
Int. Cl. E21b 33/035, 43/01
U.S. Cl. 166—.6 39 Claims

1. Apparatus for selectively making fluid connection to a well drilled into a formation underlying a body of water, comprising:

a well fluid flow control network for being positioned at a well drilled in a body of water, said well fluid flow control network including first flowline means for transferring well fluid outwardly of said well;

second flowline means for extending from a remote point to said well, said second flowline means being lowered into the body of water for connection with said first flowline means such that said well fluid is transferable through said well fluid flow control network and said first and second flowline means to a remote point;

wireline positioning means for mounting at said well and utilizing wireline apparatus to move said second flowline means into a position of initial attachment with said wireline positioning means, in which position said second flowline means is partially aligned with said first flowline means;



remotely operable power means for mounting at said well for engaging and moving said second flowline means from said position of initial attachment to a locked position in said wireline positioning means and for moving said wireline positioning means and said second flowline means to a position in which said second flowline means is substantially completely aligned with said first flowline means for connection therewith; and

flowline connection means for operatively connecting said first and second flowline means whereby well fluid is transferable from said well and through said first and second flowline means.

3,866,678

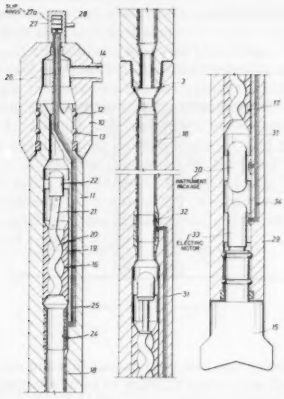
APPARATUS FOR EMPLOYING A PORTION OF AN ELECTRICALLY CONDUCTIVE FLUID FLOWING IN A PIPELINE AS AN ELECTRICAL CONDUCTOR

John D. Jeter, Dallas, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Filed Mar. 15, 1973, Ser. No. 341,771
Int. Cl. E21b 7/00, 41/00; H01b
U.S. Cl. 166—66 5 Claims

2. Apparatus for conducting electrical energy through a well bore comprising a pipe string located in a well bore having a coating of non-conducting material on the inner surface thereof through which an electrically conductive fluid flows

and insulating means located in the pipe string at spaced points through which the conductive fluid can flow for electrically insulating the fluid in the pipe string between the spaced insulating means from the fluid on the opposite sides thereof.

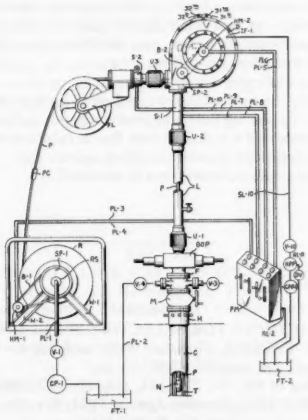


3,866,679

APPARATUS FOR INSERTING FLEXIBLE PIPE INTO WELLS

Tibor Laky, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 25, 1972, Ser. No. 300,831
Int. Cl. E21b *17/00, 33/03*
U.S. Cl. 166—77 **44 Claims**



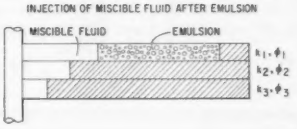
1. Apparatus for injecting an elongate soft flexible conduit into a well under pressure including: drive means connected to the upper end of the well in fluid communication therewith; seal means connected with the drive means in fluid communication therewith and sealing the drive means and the well bore against the escape of well fluids from the well bore through the drive means past the seal means; means in said drive means engaging said soft flexible conduit for drawing the same through the seal means into the drive means for passage from the drive means into the well bore; and fluid pressure supply means connectable with the end of said elongate flexible conduit exteriorly of the well for maintaining fluid under pressure within said conduit to prevent said conduit from collapsing as it is moved into the well against the pressure of well fluids confined in said well.

3,866,680

MISCIBLE FLOOD PROCESS

Dwight L. Dauben, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed July 9, 1973, Ser. No. 377,879
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **6 Claims**



1. In a method for the recovery of crude oil from an underground deposit thereof by a miscible flooding process and wherein such deposit exhibits a substantial degree of reservoir heterogeneity insofar as concerns the permeability and porosity thereof, said deposit being penetrated by an injection well and a production well, the improvement comprising:

1. introducing via said injection well an oil-in-water emulsion in which the diameter of the dispersed phase droplets is approximately the same as the diameter of the pores in the more permeable portion of said deposit whereby said emulsion primarily penetrates said more permeable portion;
2. injecting a micellar solution via said injection well into said deposit; and
3. displacing said solution toward said producing well to recover crude oil therefrom.

3,866,681

METHOD AND APPARATUS FOR ESTABLISHING A PACKER

Billie J. Shirley, P.O. Box 20648, Oklahoma City, Okla. 73120

Filed Sept. 10, 1973, Ser. No. 395,749
Int. Cl. E21b *33/12, 33/13*
U.S. Cl. 166—285 **4 Claims**

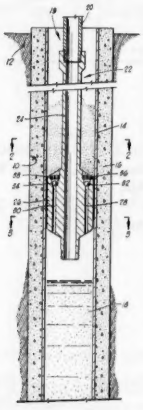
1. A method for establishing a packer around a tubing in a down hole location comprising:

forming an obstruction around the well bore contained-tubing in the annulus therearound at the location where the packer is to be formed;

moving a pumpable slurry of sand and liquid down through the tubing to a point below said obstruction; then

diverting the slurry upwardly through passageways in said obstruction into the annulus above said obstruction; and allowing the sand to settle by gravity down upon the obstruction to fill a portion of the annulus.

3. A packer for use in packing around a tubing string in a well bore comprising:



a rigid supporting and obstructing structure which includes an enlarged body portion secured in the tubing string and having downwardly and outwardly sloping shoulders at the upper side thereof, said enlarged body having a bore therethrough communicating with the bore of the tubing string and further having at least one fluid passageway extending therethrough from the lower side to the upper side thereof; and

a body of laterally supported sand resting on top of the obstructing structure.

3,866,682

PROCESS FOR CONTROLLING WATER AND GAS CONING

Lloyd G. Jones, and Nathan Stein, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 12, 1972, Ser. No. 297,174

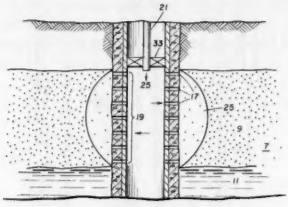
Int. Cl. E21b *33/00*

U.S. Cl. 166—285 **5 Claims**

1. A method of controlling the water-petroleum ratio of fluids produced via a cased well from a subsurface formation having a petroleum-bearing portion and an underlying water-bearing portion, said cased well having an open production interval communicating with said petroleum-bearing portion, comprising:

a. injecting via said open production interval into said petroleum-bearing portion a first fluid barrier-forming material;

b. injecting via said open production interval into said petroleum-bearing portion a second fluid to displace said first fluid barrier-forming material into the shape of a hollow frustum having the small end of said hollow frustum closed about said well at about the interface between said petroleum-bearing portion and said water-bearing portion;



c. maintaining said first fluid barrier-forming material in the shape of said hollow frustum to form a barrier shaped as a hollow frustum; and

d. producing petroleum from said petroleum-bearing portion via said open production interval of said well.

3,866,683

METHOD FOR PLACING CEMENT IN A WELL

George P. Maly, Newport Beach, and Paul W. Fischer, Whittier, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 1, 1974, Ser. No. 438,526

Int. Cl. E21b *33/13*

U.S. Cl. 166—292 **11 Claims**

1. A method for placing cement in a well drilled with a drilling mud containing agents that deleteriously affect the setting of the cement, which comprises:

displacing the drilling mud from the well with a preflush fluid comprising a highly gelled aqueous suspension of a hydrated clay that is substantially free of the deleterious cement retarding agents and that has a density at least equal to that of the drilling mud;

pumping a cement slurry into the well;

displacing the cement slurry to a desired location in the well with a displacing fluid comprising a highly gelled aqueous suspension of a hydrated clay that is substantially free of the deleterious cement retarding agents; and

permitting said cement to set in said well.

3,866,684

METHODS FOR SELECTIVE PLUGGING

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Los Angeles, Calif.

Division of Ser. No. 270,244, July 10, 1972, Pat. No. 3,811,508. This application Apr. 1, 1974, Ser. No. 456,781

Int. Cl. E21b *33/13*

U.S. Cl. 166—294 **2 Claims**

1. A method for selectively plugging water-rich strata of a relatively high-temperature subterranean formation contain-

ing strata which are water-rich and other strata which are oil-rich, and said strata having at least one borehole therein, comprising:

providing an aqueous composition comprising

a water-soluble soap of a first, high-molecular-weight, water-insoluble acid, and

an ester of a second acid, said second acid being a stronger acid than said first acid;

passing said composition into said borehole;

injecting said composition into said formation at a pressure sufficient to overcome the natural formation pressure;

hydrolyzing said ester in said high-temprature formation to form its alcohol and second acid constitutents, and thence reacting said second acid with said soap to produce as a reaction product, said first, high-molecular-weight acid, said reaction product being effective to greatly reduce the permeability of said water-rich strata, over a relatively long distance and over a relatively long period of time.

3,866,685

METHODS FOR SELECTIVE PLUGGING

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Los Angeles, Calif.

Division of Ser. No. 270,244, July 10, 1972, Pat. No. 3,811,508. This application Apr. 1, 1974, Ser. No. 456,782

Int. Cl. E21b *33/13*

U.S. Cl. 166—294 **4 Claims**

1. A method for selectively plugging water-rich strata of a subterranean formation containing strata which are water-rich and other strata which are oil-rich, and said strata having at least one borehole therein, comprising:

providing an aqueous composition of a metal salt suitable for providing available metal ions;

injecting said composition through said borehole into said formation;

providing a dilute aqueous composition of a water-soluble oil-insoluble metal soap of a high-molecular-weight acid; thence passing said soap composition into said borehole; injecting said soap composition into said formation at a pressure sufficient to overcome the natural formation pressure;

reacting said soap with the metal ions previously injected into said formation, to form as a reaction product, a second metal soap of said acid, said second metal soap being water-insoluble and oil-soluble, said reaction product being effective to greatly reduce permeability of said water-rich strata, over a relatively long distance and over a relatively long period of time.

3,866,686

FUSIBLE LINK FOR FIRE SPRINKLERS

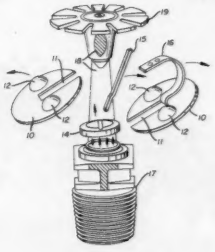
Earl M. Goodsell, Jr., Hudson, and Theodore Vorkapich, Brunswick, both of Ohio, assignors to American La France Inc., Willoughby, Ohio

Filed June 10, 1974, Ser. No. 478,155

Int. Cl. A62c *37/12*

U.S. Cl. 169—39 **6 Claims**

1. A fusible link comprising a pair of metal members positioned in superimposed relation and soldered to one another, each of the metal members having projecting registering configurations arranged to prevent the metal members from sliding sidewardly with respect to one another and each of the metal members having a slot formed therein from one side thereof, the respective positioning of the metal members being reversed in assembly so that the slot in one of said members



extends to one side and the slot in the other of the metal members extends toward the opposite side of the fusible link and so that the inner ends of the slots register and form an opening through said metal members.

3,866,687

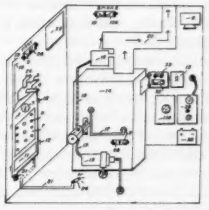
AUTOMATIC FIRE EXTINGUISHER MEANS

Philip M. Banner, 28 Oxford Rd., Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 217,098, Jan. 12, 1972, abandoned. This application Apr. 18, 1973, Ser. No. 352,127

Int. Cl. A62c *35/04*

U.S. Cl. 169—61 **27 Claims**



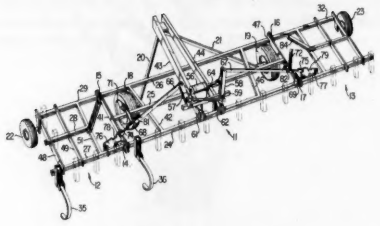
1. An automatic fire extinguisher system of the type used for fire, heat, smoke and explosion control in an area to be protected containing a plurality of hazardous zones, comprising a tank containing a fire extinguishant under pressure, a plurality of nozzles mounted on said tank, each nozzle directed towards a different hazardous zone,

an electrically actuated valve associated with each nozzle for controlling the flow of extinguishant through said nozzles, conduit means connecting said tank with said nozzle, a separate condition responsive means associated with each nozzle for detecting an abnormal condition in each hazardous zone, control circuit means connected between said condition responsive means and said valves for actuating each of said valves individually in response to detection of an abnormal condition by each of said condition responsive means and maintaining the flow of extinguishant for as long as said condition responsive means detects the abnormal condition, and automatic communication means activated by said control circuit for sending out a warning signal in response to a hazardous condition.

3,866,688
FIELD CULTIVATOR WING LIFT

Loren F. Hansen, Ankeny, Iowa, assignor to Koehring Company, Milwaukee, Wis.

Filed Dec. 13, 1972, Ser. No. 314,679
Int. Cl. A01b *63/00*
U.S. Cl. 172—311 **7 Claims**



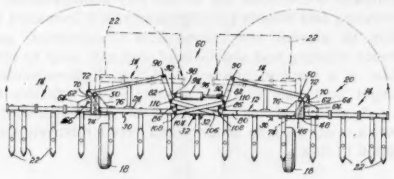
1. An agricultural implement comprising:
A. a central frame;
B. a pair of wing frames;
C. pivot means connecting each of said wing frames to said central frame in side-by-side relationship for movement of said wing frames relative to said central frame between a working position substantially in horizontal alignment with said central frame, and a transport position obliquely over said central frame; and
D. power means connected between said central frame and said wing frames including a single piston power source and a pair of linkage systems joined together for simultaneous movement for moving said wing frames from said working position to said transport position and for moving said wing frames from said transport position to said working position, said linkage systems comprising:
1. a pair of upwardly extending arms spaced longitudinally on, and pivotally connected at their lower ends to, said central frame, said arms being pivotally connected to said piston power source;
2. means interconnecting said arms for causing said arms to move simultaneously; and
3. a pair of connectors, one of which connects one of said arms with one wing frame and the other of which connects the other of said arms with the other wing frame, each of said connectors comprising:
a. an elongated rigid member pivotally connected at one end to one of said arms and pivotally connected at the other end to
b. a rigid linking member pivotally connected to one of said wing frames,
c. a latch pivotally connected to at least one of said elongated and linking rigid members, and
d. means on said wing frame for engaging said latch when said wing frame is in the transport position.

3,866,689
WING FRAME CONTROL MECHANISM FOR GROUND WORKING IMPLEMENT

Charles W. Anderson, Kewanee, Ill., assignor to Kewanee Machinery & Conveyor Co., Kewanee, Ill.

Filed Jan. 31, 1973, Ser. No. 328,472
Int. Cl. A01b *15/14*
U.S. Cl. 172—311 **7 Claims**

1. In a ground working implement having a main frame and a pair of wing frames supported by the main frame on opposite sides thereof for pivotal movement about horizontal axes between operating positions wherein the wing frames extend outwardly from the main fame in substantially planar alignment therewith and non-operating positions raised 180° from their operating positions wherein the wings are disposed horizontal and at rest on support members of the main frame; the combination therewith of control means comprising first control arms pivotally connected to each of the wing frames, second control arms pivotally connected to the main frame inwardly of and below said horizontal axes on which the wing frame pivotally move, third control arms pivotally connected to the main frame inwardly of said second control arms, each said first control arms being pivotally connected to one of said second control arms, and a control link pivotally interconnected between a respective one of said pivotally connected

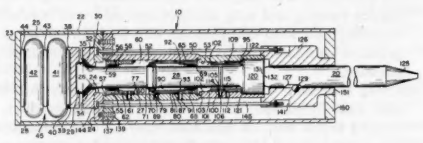


first and second control arms and a respective one of the third control arms, actuating means interconnecting said third control arms and operatively movable between first and second positions to effect selective movement of the wing frames through pivoting of said control arms and links, and cross linkage means interconnecting said third control arms for effecting simultaneous equal and opposite pivotal movements of the wing frames through substantially 180° between their operating and non-operating positions upon said actuating means moving between the first and second positions.

3,866,690
HYDRAULICALLY POWERED IMPACT DEVICE

Raymond E. Lance, Fort Worth, and Ronald N. James, Arlington, both of Tex., assignors to Construction Technology, Inc., Grand Prairie, Tex.

Filed Sept. 25, 1972, Ser. No. 292,161
Int. Cl. B25d *9/04*
U.S. Cl. 173—15 **17 Claims**

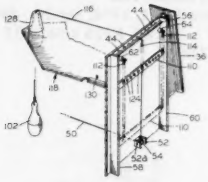


1. The hydraulic device comprising:
means forming a cylinder bore,
a reciprocable member carrying a piston reciprocally disposed in the bore, and
a valve member reciprocally disposed in the bore and adapted to sealingly engage the piston and divide the bore into first and second expansible fluid chambers such that when high pressure fluid is introduced to the first fluid chamber the combined fluid forces acting on the piston and the valve member will drive said reciprocable member against a load,
said valve member being positioned between said first chamber and said piston and having a first surface exposed to the high pressure fluid of said first chamber and a second surface abutting the piston to transfer the fluid force on the first surface to the piston thereby supplementing the area of said piston to aid in moving said reciprocable member against the load, and
means for separating the valve member from the piston after the load has been driven a distance to bypass fluid in the first expansible fluid chamber around the piston as the load returns the piston.

3,866,691
AUTOMATIC PINSETTING BOWLING GAME

Richard Freeman, Manchester, Conn., assignor to Coleco Industries, Inc., Hartford, Conn.

Filed Sept. 4, 1973, Ser. No. 394,519
Int. Cl. A63d 5/08
U.S. Cl. 273—44 8 Claims



1. A bowling game adapted to be played by rolling a bowling ball into engagement with a plurality of bowling pins comprising:

a. a housing assembly including a front housing, a rear housing, and a longitudinally extending substantially planar playing surface having one end thereof connected to said front housing and the other end thereof connected to said rear housing;

b. a plurality of bowling pins supported on said housing assembly for movement into and out of engagement with said playing surface;

c. automatic pinsetting means including reset means having a first operating condition and a second operating condition, and control means operatively connected to said reset means;

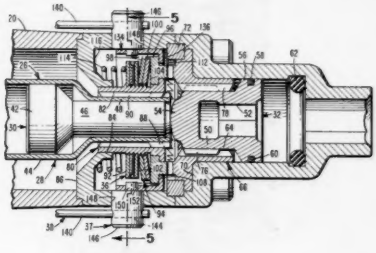
d. said reset means including first magnetic means supported on said playing surface, second magnetic means supported on said bowling pins, a plurality of cord-like members each having one end thereof attached to a corresponding one of said plurality of bowling pins, biasing means including a plurality of resilient first members each having one end thereof secured to the other end of a corresponding one of said plurality of cord-like members, a support brace having the other end of each of said resilient first members attached thereto, and stabilizing means comprising a plurality of resilient second members having one end thereof affixed to said rear housing and the other end thereof connected to said support brace for supporting said support brace in spaced relation to said rear housing for movement relation thereto between a first position which corresponds to said first operating condition of said reset means and a second position which corresponds to the second operating condition of said reset means, said stabilizing means being further operable to stabilize the movement of said support brace in moving between said first and second position thereof; and

e. control means connected to said control brace and including manually operable means supported on said housing assembly so as to be externally accessible, said control means being operable in response to actuation of said manually operable means to cause said support brace to move between said first position thereof, wherein said plurality of resilient first members of said biasing means and said plurality of resilient second members of said stabilizing means are in an extended condition thereby placing said reset means in said first operating condition thereof and said second position of said support brace wherein said plurality of resilient first members of said biasing means and said plurality of resilient second members of said stabilizing means are in a substantially relaxed condition thereby placing said reset means in said second operating condition thereof.

3,866,692
POWER TOOLS

Charles R. Stelljes, Fayetteville, N.Y., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 2, 1973, Ser. No. 328,916
Int. Cl. B25d 11/12
U.S. Cl. 173—48 8 Claims



1. A power driven device, comprising: a casing; a tool holder rotatably mounted in said casing; means which can be cycled through impacting and return strokes for imparting axial impacts to a tool mounted in said tool holder; means including a driving member and a driven member having means providing a drive connection therebetween for so connecting said impact imparting mechanism to said tool holder that said mechanism rotatably indexes said tool holder and the tool mounted therein during one of the strokes in each cycle thereof but does not effect rotation of the tool holder in the other of said strokes; and means selectively operable to effect a relative displacement between said driving and driven members which will interrupt the drive connection therebetween so that said tool can be axially impacted without rotating it, said driven member being connected to said tool holder for rotation therewith and being axially fixed relative to said casing, said tool holder and said driving member being axially movable relative to driven member, the means for connecting the impact imparting mechanism to said tool holder including means biasing said driving member toward said driven member to complete the drive connection therebetween, and the means for interrupting said drive connection being arranged to move said driving member away from said driven member against the force exerted by said biasing means.

3,866,693
VIBRATORY IMPACT HAMMER

Bernard A. Century, Cleveland Heights, Ohio, assignor to Allied Steel & Tractor Products Incorporated, Cleveland, Ohio

Filed June 11, 1973, Ser. No. 368,463
Int. Cl. B25d 11/06; F16h 33/18
U.S. Cl. 173—49 32 Claims

1. An impact force producing apparatus, comprising

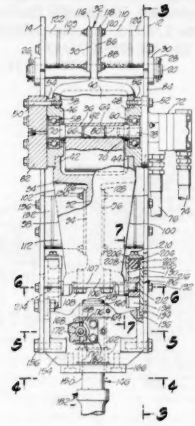
a support frame;

an impacting member resiliently mounted on said frame for relatively free vibrational movement thereof;

a plurality of resilient elements, each resilient element being attached at one position thereof to said support frame and at a second position thereof to said impacting member;

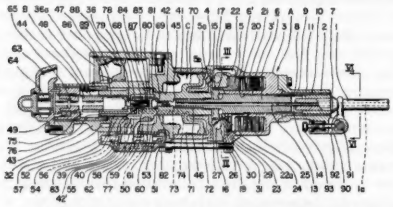
vibration drive means operably mounted on said impacting member, said drive means being positioned to induce straight line motion in said impacting member at one

location on said impacting member; and
an impact transmitting surface located on said impacting



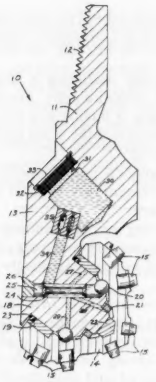
member at the point on said impacting member where straight line motion is experienced.

3,866,694
ROCK DRILL
Michio Motokura, Osaka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed July 13, 1973, Ser. No. 379,075
Claims priority, application Japan, July 14, 1972, 47-69886; July 14, 1972, 47-69888; July 14, 1972, 47-82989
Int. Cl. B25d *9/00*
U.S. Cl. 173—75 **7 Claims**



7. A rock drill comprising:
a head body;
a sleeve formed on the inside of said head body;
a drilling tool slidably and rotatably engaged with said sleeve and having an air hole therein;
a main body connected to said head body;
hydraulically operated drill hammering means for imparting reciprocal movement to said tool having a piston slidably inserted within said sleeve and said main body and having a passage formed axially therethrough;
rotating means for rotating said drilling tool having a piston slidable therein and engaged with the piston of said drill hammering means; and
means for blasting air from said drilling tool to remove particulate matter from around said tool comprising an air intake port connected to said drilling tool hole through said passage of said drill hammering means and said piston of said drill rotating means, check valve means in said piston of said drill rotating means and air accumulating means, wherein said piston of said drill rotating means operates as a compressor interposed between said air accumulating means and the passage in said piston of said drill hammering means and said check valve means for feeding compressed air through said passage of said piston of said drill hammering means to said drilling tool.

3,866,695
BEARING CAVITY PRESSURE MAINTENANCE DEVICE FOR SEALED BEARING ROCK BIT
Robert Allen Jackson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed July 1, 1974, Ser. No. 484,385
Int. Cl. E21b *9/08, 9/35*
U.S. Cl. 175—228 **6 Claims**



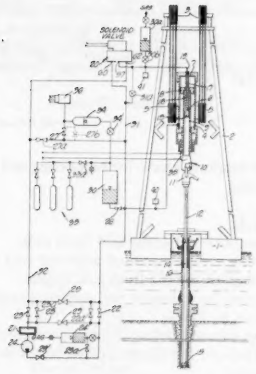
1. A sealed bearing rotary rock bit with an internal reservoir containing lubricant for drilling in a fluid-filled borehole wherein pressure differentials occur between the pressure of the lubricant in the internal reservoir and the fluid in the borehole, comprising:
a bit body;
at least one bearing shaft extending from said bit body;
a cutter rotatably mounted upon said bearing shaft;
bearing means between said cutter and said bearing shaft for promoting rotation of said cutter;
a lubricant area between said cutter and said bearing shaft;
seal means for retaining lubricant in said lubricant area and preventing fluid in the borehole from entering the lubricant area;
a lubricant reservoir in said bit body;
means for equalizing the pressure of lubricant in the lubricant reservoir with the pressure of fluid in the borehole; passage means channeling lubricant from said lubricant reservoir to said lubricant area;
means for allowing flow of lubricant from said lubricant reservoir to said lubricant area in response to any pressure differential; and
means for allowing flow of lubricant from said lubricant area to said lubricant reservoir at pressure differentials above a predetermined pressure differential.

3,866,696

METHOD AND APPARATUS FOR THE CONTROL OF A WEIGHT SUSPENDED FROM A FLOATING VESSEL

Edward Larralde, and Glen Robinson, both of Santa Barbara, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Continuation-in-part of Ser. No. 274,880, July 25, 1972,. This application June 27, 1973, Ser. No. 373,968
Int. Cl. E21b 19/08
U.S. Cl. 175—5 16 Claims



1. In an apparatus adapted to be mounted on a vessel subjected to heave due to wave action, which apparatus includes a piston and hydraulic cylinder and co-acting pneumatic accumulator system for control of the pressure in the hydraulic cylinder, means for connecting a load to said piston, the improvement which comprises means adapted to pass liquid under pressure from a source of liquid to the accumulator system, during that portion only of the heave when the volume of the liquid in the accumulator tends to decrease, a reservoir, means for withdrawing liquid from the accumulator to said reservoir during that portion only of the heave when the volume of liquid in the accumulator tends to increase.

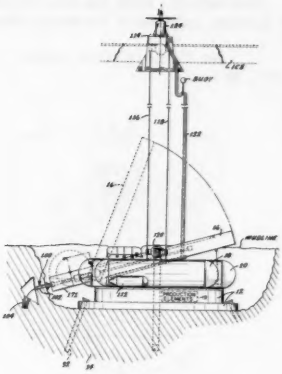
3,866,697

DRILLING SYSTEM

Andre M. Rossfelder, La Jolla, and William S. Bates, Arcadia, both of Calif., assignors to Tetra Tech, Inc., Pasadena, Calif.

Filed July 12, 1972, Ser. No. 271,117
Int. Cl. E21b 7/12
U.S. Cl. 175—5 8 Claims

1. A drilling system for functioning in a subsurface environment comprising:
a base for being connected to ground;
a platform rotatably connected to said base;
a cylindrical drilling structure pivotally mounted to said platform, said drilling structure including a hinged cover over one end thereof; and
a plurality of drill pipe aligned parallel to the longitudinal axis of said drill structure and along the inner periphery thereof.

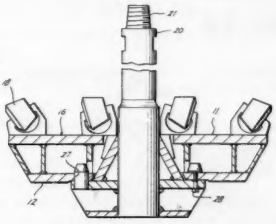


3,866,698

RAISE DRILLING BIT

John M. Stanley, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Nov. 16, 1973, Ser. No. 416,362
Int. Cl. E21c 23/00
U.S. Cl. 175—53 10 Claims



1. A rotary drill bit for producing a raise bore by disintegrating the earth formation surrounding a pilot hole comprising:
a drill head having an upper mounting member and an attachment portion,
a plurality of cutters secured to said upper mounting member,
a drive stem,
said drive stem being fastened to said attachment portion and extending through said upper mounting member without force transmitting contact therewith thereby to be floating with respect to said upper mounting member.

3,866,699
PERSONNEL SCALE APPARATUS

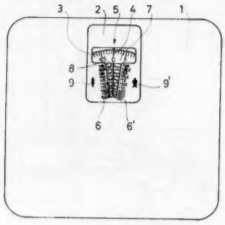
Karl Soehnle, Murrhardt; Richard Scheerer, Murrhardt-Harbach; Klaus Gutzy, Murrhardt; Rido Busse, Oberelchingen, and Reinhold Rapp, Ulm/Donau, all of Germany, assignors to Murrhardter Waagenfabrik Gebr. Soehnle, Murrhardt, Germany

Filed Sept. 21, 1973, Ser. No. 399,507

Claims priority, application Germany, Feb. 17, 1973, 2307879

Int. Cl. G01g *19/04, 23/00*

U.S. Cl. 177—34 23 Claims



1. A personnel scale apparatus, comprising first means for determining the actual weight of a person; second means for indicating different body heights, including a body-height scale and two prisms which are spaced from said body-height scale and from one another and which extend in parallelism with said body-height scale; third means for indicating for each body height the ideal weight which is desirable; and fourth means for indicating the actually determined weight as well as the magnitude of deviation of the actually determined weight from the ideal weights associated with respective different body heights.

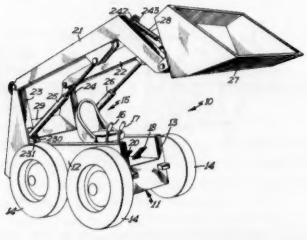
3,866,700
TRACTOR VEHICLE WITH HYDROSTATIC DRIVE MEANS

James J. Bauer, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 800,839, Feb. 20, 1969, Pat. No. 3,635,365. This application Sept. 16, 1971, Ser. No. 181,211

Int. Cl. B62d *11/04*

U.S. Cl. 180—6.48 9 Claims



1. In a tractor vehicle having an engine in the rear and a pair of ground engaging wheels on each side of said vehicle, the space transversely between the pairs of wheels being greater than the space longitudinally between each wheel of the pairs of wheels on opposite sides of the vehicle hydrostatic means for each pair of wheels to selectively connect said engine to said wheels to propel said vehicle, each of said hydrostatic means comprising:

a variable displacement pump driven by said engine;

a hydraulic motor operatively connected to said pump; and

means for varying the displacement of said pump infinitely between a range of zero to maximum displacement in either forward or reverse directions at a given r.p.m. to thereby drive said wheels on one side of said vehicle independently with respect to said wheels on the other side of said vehicle in forward and reverse directions.

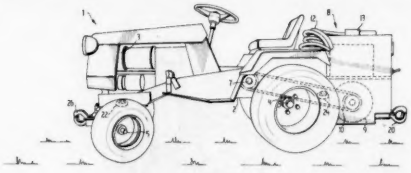
3,866,701
GROUND SUPPORT UNIT

Peter O. E. Bekker, 23 Upland Ln., Armonk, N.Y. 10504

Filed May 21, 1973, Ser. No. 362,532

Int. Cl. B60d *1/16*

U.S. Cl. 180—14 C 7 Claims



1. A ground support vehicle for supporting and transport by aircraft including

a rear axle,

a forward axle,

an engine mounted adjacent said front axle,

engine starting means mounted adjacent said rear axle on the side thereof remote from said engine,

coupling means for engaging and moving aircraft, said coupling means including

a coupling positioned below said engine-starting means and mounted on said vehicle on a plane below the level of the rear axle and

lifting means distributed on said vehicle for engagement and transport by aircraft.

3,866,702
ACCELERATOR FOR CAR TRANSMISSION SYSTEM

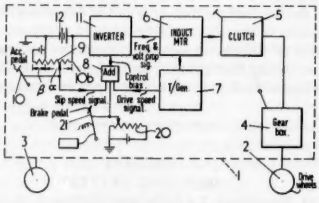
John Frederick Eastham, Long Ditton, England, assignor to K. G. Engineering Laboratories Limited, Birmingham, Warwickshire, England

Filed July 2, 1973, Ser. No. 375,643

Claims priority, application Great Britain, July 26, 1972, 35009/72

Int. Cl. B60k *1/00*

U.S. Cl. 180—65 R 13 Claims



1. A battery driven vehicle having an inverter provided with d.c. and a.c. terminals, a battery connected to said d.c. terminals, an induction motor powering said vehicle and connected to said a.c. terminals, biassing means controlling the frequency and power output of said inverter, an accelerator member having a rest position and consecutive first and second ranges of movement from said rest position, resilient means urging said member to said rest position, a transducer providing a first electrical signal which varies with movement

of said member from said rest position, and speed sensitive means driven by said induction motor and providing a second electrical signal which is significant of the induction motor speed said first and second signals being fed to said biassing means to control the inverter frequency; in which vehicle the transducer provides said biassing means in the first range of member movement with a first signal which diminishes progressively in a range corresponding to the generation of negative torque by the induction motor and consequential regenerative braking, while progressive movement through the second range of member movement causes the first signal to accelerate the induction motor.

3,866,703

ELECTRIC DRIVE TRANSMISSION SYSTEMS

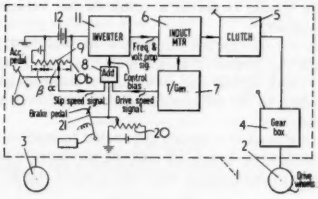
John Frederick Eastham, Long Ditton, England, assignor to K. G. Engineering Laboratories Limited, Birmingham, Warwickshire, England

Filed July 2, 1973, Ser. No. 375,644

Claims priority, application Great Britain, July 26, 1972, 35008/72

Int. Cl. B60k *1/00*

U.S. Cl. 180—65 R **3 Claims**



1. A car having a battery, a solid state inverter connected to receive direct current from said battery, an induction motor supplied with alternating current from the inverter, drive wheels, a drive transmission connecting the induction motor to the drive wheels, a gear box and clutch connected in said drive transmission, a speed control pedal, a brake pedal, bias means controlling the operating frequency of said inverter so that the motor slip speed is that required to produce a desired motor output torque, first signal generating means controlled by said motor and providing said bias means with a first signal significant of the actual speed of the motor, and second signal generating means controlled by said speed control pedal and producing a first range of second signals with slight depression of the speed control pedal and a second range of second signals with further depression of the speed control pedal said second signal generating means providing said second signals to the bias means; said bias means so controlling said inverter output frequency and the gears being so chosen that the motor delivers the called-for torque at high efficiency without overheating and the influence of said first range of second signals on the bias means is to so vary the inverter output that the motor is regeneratively braked by feeding power back through the inverter to the battery while the influence of said second range of second signals on the bias means is to vary the inverter output to accelerate the motor to an increased torque delivery dependent on the pedal position.

3,866,704

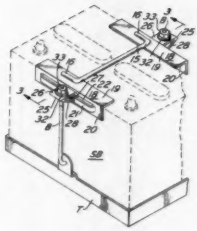
BATTERY HOLDDOWN

Bernard P. Bowers, Ontelaunee Twsp., Berks Co., and Delight E. Breidegam, Jr., Kutztown, Berks Co., both of Pa., assignors to East Penn Manufacturing Company, Inc., Lyon Station, Pa.

Filed Feb. 8, 1973, Ser. No. 330,516

Int. Cl. B60r *18/02*

U.S. Cl. 180—68.5 **6 Claims**



1. A battery holddown device which comprises

a cross rod,

holder brackets of inverted L-shape in cross section with horizontal flanges having upper faces to which the ends of said cross rod are secured in fixed relation,

said holder brackets having lower faces for engagement with a battery case,

said holder brackets having integral vertical flanges extending downwardly from said horizontal flanges with inner faces for engagement with said battery case,

each of said vertical flanges having an outer face with a strip therealong for the major portion of the length of the holder bracket offset outwardly from the outer face to provide a vertical space between the strip and the vertical flange, and

members selectively positioned along and engaging each of said holder brackets for holding said holder brackets in engagement with a battery case,

said last mentioned members each having an upper portion adapted to be held against movement from exteriorly of the holddown device and a portion extending vertically downwardly therefrom and in said space,

at least one of said members comprising a clip having a portion in clamped engagement with an outer face of said strip,

said clip having

said upper portion horizontally disposed,

said vertically downwardly extending portion extending from one edge of said upper portion,

a downwardly and inwardly inclined bracing wall portion extending from the other edge of said upper portion,

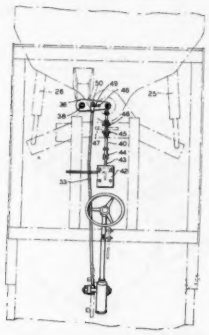
a vertically upwardly extending terminal rib providing the portion in clamped engagement with the outer face of said strip and extending upwardly from said bracing wall portion, and

said upper portion of said clip and said downwardly inclined bracing wall portions having openings for the reception of a vertical clamping bolt.

3,866,705
ADJUSTABLE RATIO STEERING CONTROL FOR ARTICULATED VEHICLE

Charles M. Anderson, Aylmer, Ontario, Canada, and Charles R. Sturtz, Jr., Romulus, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 17, 1973, Ser. No. 407,406
Int. Cl. B62d *13/00*
U.S. Cl. 180—79.2 B 7 Claims



1. In an articulated vehicle having a front frame section, a rear frame section pivotally connected to the front frame section on a vertical steering axis between the two sections about which one section turns relative to the other, a pair of steering jacks, one on each side of the steering axis extending between the front and rear frame sections being fluid operable to extend and retract to cause turning movements of the frame sections, and a manual steering device located on the front frame section operable to impart steering commands for controlling the steering jacks, the improvement comprising an adjustable ratio steering control system including a single steering control lever pivotally mounted on the rear frame section on a vertical axis offset laterally with respect to the steering axis, first means fluid coupling the steering jacks mounted on the front frame section having movable fluid control means operable from a neutral position at which the steering jacks are held at relatively equal extensions for straight ahead steering of the vehicle sections to positions displaced from said neutral position for supplying fluid under pressure to the steering jacks causing one to extend and the other retract proportionately to the magnitude of said steering commands, second means connecting the manual steering device and steering control lever for transmitting said steering commands to the latter, third means connected between said steering control lever and said movable fluid control means and steering sensitivity adjustment means on said steering control lever adjustable to various positions at which steering commands are received by the steering control lever increasing in sensitivity as the radial distance increases from the pivot axis of said lever.

3,866,706
VEHICLE STEERING ARRANGEMENT

Wolfgang Lincke; Walter Zimdahl, both of Wolfsburg; Peter Andreas, Fallersleben; Harald Schimkat, Flechtorf, and Hans Kuhlborn, Wolfsburg, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

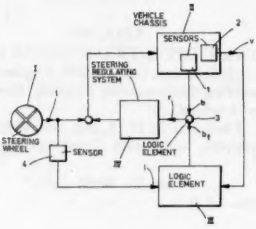
Filed Apr. 15, 1974, Ser. No. 460,709
Claims priority, application Germany, May 2, 1973, 2322062
Int. Cl. B62d *5/00*
U.S. Cl. 180—79.2 R 7 Claims

1. Vehicle steering apparatus having means for compensating the influence of disturbing lateral forces on the direction of travel, said apparatus comprising, in combination:

a. first reference signal generator means for producing at least one first signal corresponding to the actual lateral acceleration of the vehicle;

b. second reference signal generator means for producing at least one second signal corresponding to the steering commands of the vehicle operator;

c. third reference signal generator means for producing at least one third signal corresponding to the travelling speed of the vehicle;



d. first logic means connected to said second and third generator means for receiving said second and third signals and producing at least one fourth signal corresponding to the theoretical lateral acceleration of the vehicle which should occur as a result of the vehicle steering commands;

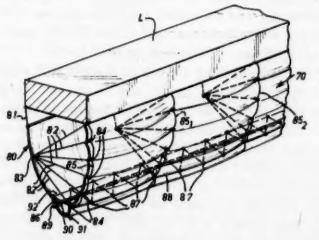
e. second logic means connected to said first generator means and to said first logic means for receiving said first and fourth signals and producing a control signal corresponding to the difference between said first and fourth signals; and

f. steering regulator means connected to said second logic means for regulating the steering servomechanism of the vehicle in accordance with said control signal.

3,866,707
AIR CUSHION VEHICLE FLEXIBLE SKIRT ARRANGEMENT

Charles Paoli, Groupe Scolaire Albert Camus, Le Port Marly, France

Filed Mar. 7, 1973, Ser. No. 339,003
Claims priority, application France, Mar. 10, 1972, 72.08341
Int. Cl. B60v *1/16*
U.S. Cl. 180—127 13 Claims

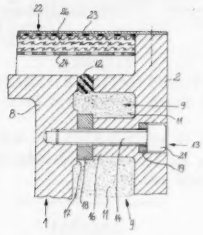


8. The construction as claimed in claim 7 wherein said one arm extends parallel to said structural element.

3,866,708
MEANS FOR REDUCING NOISE IN TOBACCO PROCESSING MACHINES OR THE LIKE

Willy Rudszinat, Dassendorf; Anton Baier, Ahrensburg; Uwe Heitmann, and Peter Brand, both of Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Apr. 2, 1974, Ser. No. 457,230
Claims priority, application Great Britain, Apr. 18, 1973, 18585/73
Int. Cl. A24c *5/30*
U.S. Cl. 181—33 R **13 Claims**

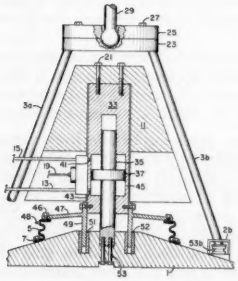


1. In a machine for the production and/or processing of smokers' products, the combination of a mounting wall; a plurality of processing devices movably supported by said wall; a transmission assembly having a plurality of mobile elements, said transmission assembly being connected with said mounting wall and said element being arranged to drive said processing devices with attendant generation of noise; first soundproofing means interposed between said wall and said transmission assembly; and second soundproofing means interposed between said elements and said devices.

3,866,709
VIBRATORY SEISMIC ENERGY GENERATOR

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 12, 1973, Ser. No. 415,266
Int. Cl. G01v *1/04*
U.S. Cl. 181—114 **5 Claims**



1. Apparatus for producing vibratory seismic energy in the earth, comprising:

an earth coupling plate;

means for imparting vibratory motion to said plate including power piston means, power cylinder means for said piston, and connecting rod means connecting said piston to said plate;

annular sleeve bearing means in said plate surrounding said rod means;

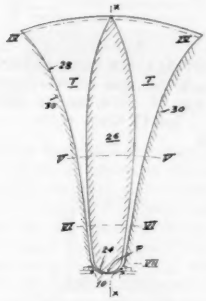
annular movable bearing means around said rod means connected to said cylinder means and extending into said annular sleeve bearing means; and

elastic means of low compliance connected to said plate and to said cylinder means or said movable bearing means for supporting said cylinder means on said plate.

3,866,710
HORN LOUDSPEAKERS

Mario Cesati, 16 Via De Vitalis, Brescia, Italy

Filed Nov. 1, 1972, Ser. No. 302,752
Int. Cl. G10k *11/10*
U.S. Cl. 181—159 **9 Claims**

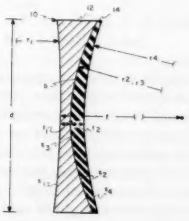


1. An acoustic device, particularly a horn-type loudspeaker, comprising an electro-magnetic transducer comprising a substantially rigid diaphragm having an active surface having a center and being mounted for oscillation in its entirety in a direction substantially normal to the outer contour of said surface; a first stationary member having an outer surface a portion of which is closely adjacent to said active surface; a second stationary member surrounding at least in part said first stationary member and having an inner surface from said outer surface of said first member, the curvature of the surfaces of said members and said diaphragm defining an air passageway extending from the center of said diaphragm in a direction transverse to said direction of oscillation, the cross section of said air passageway being minimal at said center and increasing in said direction.

3,866,711
SOLID ULTRASONIC LENS DOUBLET

Donald L. Folds, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 4, 1973, Ser. No. 366,398
Int. Cl. G01s *3/80;* **H04r** *23/00*
U.S. Cl. 181—176 **9 Claims**



1. An ultrasonic lens of the character described comprising:

a first thin lens element comprised of a substantially acoustically clear, rigid, first solid material;

a second thin lens element comprised of a substantially acoustically clear, elastically pliant second solid material which is soft compared to said first solid material;

said first lens element having first and second surfaces respectively characterized by first and second radii of curvature;

said second lens element having third and fourth surfaces respectively characterized by third and fourth radii of curvature; and

said second material of said second lens element being bonded directly to said first solid material of said first lens element, with said second and third surfaces being defined by the boundary between said solid materials.

3,866,712

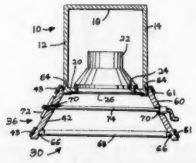
COLLAPSIBLE SPEAKER EXTENSION

James A. Carruthers, P.O. Box 40, Warrenton, Oreg. 97146

Filed Apr. 19, 1974, Ser. No. 462,373

Int. Cl. G10k *11/10*

U.S. Cl. 181—178 **14 Claims**



1. A collapsible extension for an acoustical speaker comprising a substantially planar top member having opposed marginal edge portions, a first side pivotally connected to one of said edge portions and a second side pivotally connected to the opposite edge portion of said top member, said first and second sides being swingable toward and way from each other between operative positions disposed at substantial angles relative to said top member and extending outwardly in a common direction from the top member and closed positions disposed substantially parallel to and adjacent said top member, substantially rigid spacer means insertable between said sides when said sides are in their operative positions, operable to inhibit swinging of said sides toward each other to maintain a preselected spacing therebetween, and detachable tension means interconnecting said sides operable to draw said sides toward each other and hold them against said spacer means.

3,866,713

AERIAL PLATFORM APPARATUS

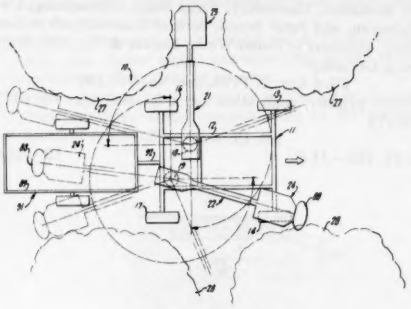
Charles E. Carpenter, and James M. Carpenter, both of Lakeport, Calif., assignors to Carpenter and Carpenter, Lakeport, Calif.

Filed Feb. 1, 1973, Ser. No. 328,511

Int. Cl. B66f *11/04*

U.S. Cl. 182—2 **3 Claims**

1. In apparatus for moving an operator relative to a work location, such as a fruit-bearing tree, the combination including a mobile vehicular support, an upright tower carried by the support, a platform for carrying said operator, and an extensible boom having a distal end mounted on said platform and a proximal end, a bearing member mounted on said tower for pivotal movement about a vertical axis, means mounting said boom proximal end on a margin of said bearing member for pivotal movement about a horizontal axis, a support frame mounted on a portion of said tower below said bearing member for rotary movement about said vertical axis, brace means interconnecting said bearing member for rotary movement with said support frame, and rotary actuator means on said



mobile support for selectively rotating said support frame about said vertical axis.

3,866,714

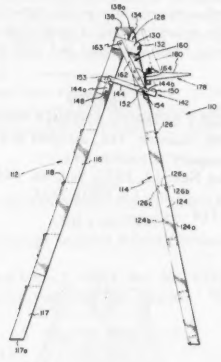
CONVERTIBLE LADDER

Noel E. Waldron, Rt. No. 1, Elwell, Mich. 48832

Continuation-in-part of Ser. No. 267,551, June 29, 1973, Pat. No. 3,785,455. This application Dec. 13, 1973, Ser. No. 424,189

Int. Cl. E06c *1/18*

U.S. Cl. 182—22 **11 Claims**



1. A ladder which can be selectively converted to either an extension ladder or a step ladder comprising:

front and rear ladder longitudinally extending sections each including a plurality of longitudinally spaced steps;

coupling means mounting said rear ladder section on the rear face of said front ladder section for either swinging movement between a position, generally parallel to and coextensive with said front ladder section, and a position inclined to said front ladder section in which said ladder is configured as a step ladder, or generally parallel, longitudinal, relative sliding movement between said coextensive position and an extended position, generally parallel to said front ladder section, in which said ladder is configured as an extension ladder including:

rear ladder section support means having at least a portion mounted on said front ladder section for movement with the rear ladder section when said rear section moves between said coextensive position and said

inclined position, said portion being movable between a position permitting said rear section to be moved from said extended position to said coextensive position, and a support position underlying a portion of said rear ladder section to preclude relative movement of said rear ladder section from said extended position to said coextensive position; and

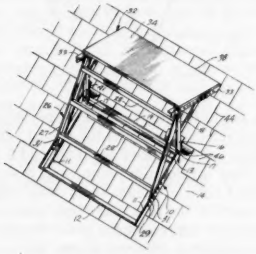
latch means mounted on said front ladder section for movement between a first position in which it holds said rear section in said inclined position and a second position in which it prevents said support means and said rear ladder section from moving away from said front section when said rear ladder section is in either said coextensive position or said extended position.

3,866,715

ADJUSTABLE ROOFING PLATFORM

Frank M. Foulk, 2015 S. Primrose, South Pasadena, Calif. 91030

Filed Apr. 22, 1974, Ser. No. 462,855
Int. Cl. E04g *3/12*
U.S. Cl. 182—45 **11 Claims**



1. An adjustable roofing platform comprising:

a roof frame adapted to lie flat against a sloping roof;

an L-shaped platform support frame comprising:

a riser; and

a stage bracket normal to the riser and rigidly secured thereto;

means for pivotally interconnecting the lower end of the riser and the upper end of the roof frame;

a diagonal bracing frame;

means for pivotally interconnecting the upper end of the bracing frame to the platform support frame at an upper portion thereof;

means for connecting the lower end of the bracing frame to the roof frame at any of a plurality of positions spaced below the riser for setting the riser in a vertical plane and the stage bracket in a horizontal plane on a sloping roof;

a stage;

means for mounting the stage on the stage bracket in any of a plurality of positions along the length thereof so that an edge of the stage is in or only slightly above the plane of the roof frame; and

spike means only at the upper end of the roof frame for embedding in a roof and preventing sliding of the roofing platform.

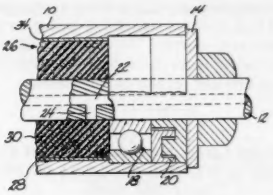
3,866,716

ROTARY ROLLER LUBRICANT ACCUMULATOR

Carl G. Matson, 410 E. Central Blvd., Kewanee, Ill. 61345

Filed Jan. 14, 1974, Ser. No. 433,098
Int. Cl. F01m *1/00*; **F16n** *1/00*
U.S. Cl. 184—14 **17 Claims**

1. A rotary roller lubricant accumulator structure including a cylindrical shaft, a cylindrical member having a hollow cylindrical interior loosely concentric with the shaft and providing, with the shaft and the interior of the member, a cylindrical annular space, a pair of coaxially spaced apart antifriction bearings inter-journalling the shaft and member, a pair of lubricant seals respectively axially outwardly of the bearings, said shaft having an axial passage opening radially to said space intermediate the bearings and opening at at least one end of the shaft for accommodating the supply of lubricant under pressure to said space, and lubricant accumulator means in said space, characterized in that said means includes



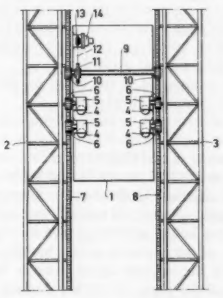
a cylindrical tubular shell relatively closely surrounded by the interior surface of the member and extending substantially from one bearing to the other, and a cylindrical core within and substantially coextensive in length with the shell and having an axial opening relatively closely surrounding the shaft, said core being of resilient, sponge-like material capable of radial deformation under pressure of lubricant forced between the shaft and core via the supply passage and also capable of recovering its pre-deformed state so as to pressurize the lubricant axially toward the bearings.

3,866,717

RACK AND PINION ELEVATOR WITH AT LEAST TWO RACKS

Martin Johansson, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Feb. 23, 1973, Ser. No. 335,387
Claims priority, application Sweden, Feb. 24, 1972, 2279/72
Int. Cl. B66b *11/04*
U.S. Cl. 187—19 **4 Claims**



1. A rack and pinion elevator system comprising a pair of horizontally spaced, vertically extending racks having an elevator cage vertically movable therebetween, drive means for selectively effecting movement of said cage along said racks comprising at least two separate drive motors carried by said cage, a first one of said drive motors having a first output shaft carrying a first output pinion which is in driving engagement with one only of said racks, a second one of said drive motors having a second output shaft separate from said first output shaft and carrying a second output pinion which is in driving engagement with the other one only of said racks, and a transmission device carried by said cage and extending between

said racks for movement along said racks with said elevator cage, said transmission device being separated from said drive means and being responsive to off-center placement of a load in said cage for transferring forces from the less-loaded one of said racks to the more-loaded one of said racks thereby to substantially equalize the loads on said two drive motors, said transmission device comprising an elongated third shaft spaced from each of said first and second shafts and extending between said pair of racks in parallel relation to said first and second shafts, said third shaft being mounted for rotation at a predetermined position on said elevator cage spaced from the location of said drive motors, the opposing ends of said third shaft respectively carrying third and fourth pinions which engage said pair of racks respectively at positions spaced from each of said first and second output pinions.

3,866,718

REELING OF LOAD AND SAFETY CABLES OR ROPES FOR CAGES SUSPENDED IN FRONT OF BUILDINGS OR THE LIKE

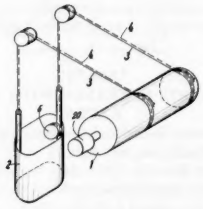
Richard Hiergeist, Munich, Germany, assignor to Mannesmann Leichtbau Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed June 13, 1972, Ser. No. 262,255

Claims priority, application Germany, June 14, 1971, 2129447

Int. Cl. B66b *11/06, 5/00*

U.S. Cl. 187—27 **5 Claims**



1. In a reeling device for at least one load rope or cable and at least one safety rope or cable both being attached to a cage for suspending the cage to be lifted and lowered and used, for example, in front of buildings, the device including, a single reeling drum having a spiral groove;

a winch-motor connected to the drum for driving the drum in one or the opposite direction;

the load and safety ropes or cables being connected to the drum, so that upon rotation of the drum by operation of the winch motor in one direction, a first one of the ropes or cables is wound to locate in the spiral groove of the drum and in adjacent loops thereon, thereby establishing a second spiral groove, a second one of the ropes or cables locating in the second groove during the rotation, the first one of the ropes or cables having one additional loop to start the second spiral groove for placing the second one of the ropes or cables therein;

the first one of the ropes or cables as being wound in the spiral groove of the drum establishing a first layer on the drum having a diameter larger than a diameter of the second one of the ropes or cables as being wound concurrently in a second layer on top of the first layer and in the second spiral groove as it is being established by winding of the first rope or cable; and

means connected to one of the ropes or cables and being continuously effective during winding and unwinding of the ropes or cables onto and from the drum for continuously providing an effective length change of the portion of the one cable or rope as extending from the drum and to the cage where attached thereto, in addition to the length change resulting from lifting or lowering the cage, for compensating for differences in reeled lengths of the load and safety ropes due to difference diameters of said layers, for obtaining similar lengths displacement of the load and safety cables or ropes at the cage.

3,866,719

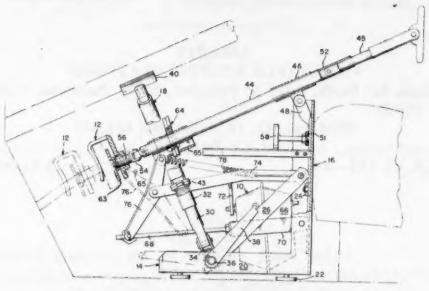
REMOTELY CONTROLLED BRAKE SYSTEM

John F. Streutker, Route 4, Box 553, Port Orchard, Wash. 98366

Filed Feb. 22, 1973, Ser. No. 334,862

Int. Cl. B60t *13/24*

U.S. Cl. 188—3 R **7 Claims**



1. A remotely controlled brake system operating between towed and towing vehicles in which the towed vehicle has a floor, a seat, a rigid support above the floor and a pedal-type foot brake operating mechanism comprising brake actuator means in the towed vehicle; means removably coupling said brake actuator means to the foot brake operating mechanism of the towed vehicle for depressing the pedal along a path, said actuator means including powered means for moving the brake pedal, first brace means for supporting the powered means on the floor, second brace means for supporting the powered means from the seat of the towed vehicle, and third brace means for supporting said powered means from the rigid support; and control means coupled to said powered means for controlling the operation of said brake pedal, said coupling means including a clamp having an abutment surface for engaging the brake pedal and an opposed clamping surface adjustably connected with said abutment surface for clamping the pedal therebetween, said actuator means including a guide bar coupled to said clamp in generally axial alignment with said pedal depressing path and having means for quickly adjusting the distance between the pedal and the powered means for initially pressing the abutment surface against the pedal, and a lever arm pivoted to said second brace and to said guide bar for movement generally along said path for depressing the pedal upon energization of the powered means.

3,866,720

FRICTION DAMPER

Leon Wallerstein, Jr., Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Sept. 20, 1973, Ser. No. 399,763

Int. Cl. B65h *59/10*

U.S. Cl. 188—67 **18 Claims**

1. A friction damper comprising

a housing,

an elongate bar disposed longitudinally within said housing, said housing and bar being capable of reciprocating movement longitudinally relative to each other in an energy absorbing stroke and return stroke,

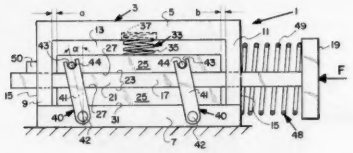
friction shoe means disposed between said housing and bar for movement parallel to said bar and housing,

resilient means urging said shoe means and one of said housing and bar transversely relative to the other of said housing and bar and normally maintaining sliding fric-

tional engagement between said shoe means and the one said housing and bar,

said shoe means and the other of said housing and bar being disposed for and subject to limited relatively free sliding relative movement between each other substantially independent of said resilient shoe urging means,

means for limiting the movement of said shoe means relative to the other of said housing and bar in the energy absorbing stroke beyond said relatively free sliding relative movement, and



spacing means operative independently of said resilient shoe urging means in response to said free sliding relative movement for controlling the spacing between said shoe means and the one of said housing and bar, said spacing means being operative in the energy absorbing stroke to permit maintenance of frictional engagement by said independent resilient shoe urging means between said shoe means and the one of said housing and bar, said spacing means being operative in the return stroke in response to and during said relatively free sliding relative movement to positively increase the spacing between said shoe means and the one of said housing and bar and relieve said frictional engagement.

3,866,721

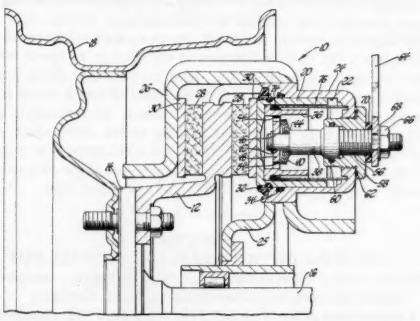
DISC BRAKE PARKING FEATURE

William L. Pringle, Gross Pointe Shores, Mich., assignor to William L. Pringle & Associated, Inc., Detroit, Mich.

Filed Jan. 15, 1973, Ser. No. 323,481

Int. Cl. F16d *55/26*

U.S. Cl. 188—72.6 **14 Claims**



1. A disc brake assembly comprising: friction means for frictionally engaging a rotor, and actuator means for moving said friction means into frictional engagement with the rotor in response to the application of a braking force; said actuator means including a mechanically movable shaft member, an actuator member engageable with said friction means mounted on said movable shaft member and movable relative to said movable shaft member between first and second positions, said first position being toward frictional engagement, and mechanical energy storage means operatively connected between said movable shaft member and said actuator member to continuously urge said actuator member toward said first position for maintaining said friction means in frictional engagement with the rotor wherein said mechanical energy storage means acquires mechanical energy during the application of a braking force which causes movement of said actuator member from said first position to said second position.

3,866,722

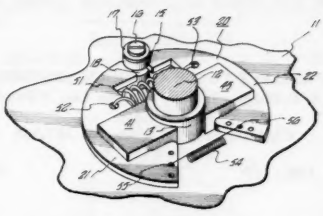
MECHANICAL DRAG BRAKE ASSEMBLY

Magne J. Kjos, 1748 La Granada Dr., Thousand Oaks, Calif. 91360, assignor to Burrough Corporation, Detroit, Mich.

Filed July 2, 1973, Ser. No. 375,456

Int. Cl. F16d *49/16*

U.S. Cl. 188—75 **8 Claims**



5. A drag brake assembly adapted for self-aligning mounting to provide braking force upon a cylindrical shaft comprising in combination:

a. a first brake shoe having a contoured face shaped to engage the surface of said cylindrical shaft and a bearing end opposite the contoured face;

b. a first brake shoe support member having first and second ends and an intermediate portion between the first and second ends, the intermediate portion of said support member and the bearing end of said first brake shoe being arranged in interlocking relationship, free of attachment therebetween;

c. a second brake shoe substantially identical to said first brake shoe;

d. a second brake shoe support member substantially identical to said first brake shoe support member; and

e. spring means connected between said first and second brake shoe support member for holding said first brake shoe support member with its first brake shoe and said second brake shoe support member with its second brake shoe in a position about the cylindrical shaft, said support members being relatively rotatable and translatable over a limited range with respect to each other.

3,866,723

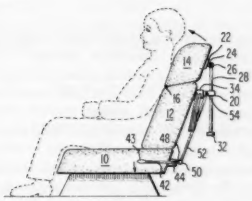
SAFETY DEVICE FOR ACTUATING A BRAKE

Elmer M. Smith, 2425 Kuser Rd., Trenton, N.J. 08690

Filed Nov. 12, 1973, Ser. No. 414,769

Int. Cl. B60t *7/14*

U.S. Cl. 188—109 **5 Claims**



1. In a motor vehicle having a seat for an operator and a brake for controlling such vehicle, means for actuating such brake, which means is automatically responsive to the pres-

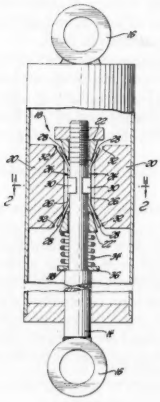
ence and absence of an operator in his seat, comprising a movable member associated with said seat and operatively connected to said brake, such movable member being movable from a first position in which such member acts to disengage the vehicle brake when the operator is in a normal driving position on said seat, to a second position in which such member acts to disengage said brake when the operator is not in a normal driving position on said seat, the movable member consisting of a two part seat back, one part of which is non-movable and conventionally attached to the base of the seat, and the other part of which is movable, and hinged to the non-movable part and subject to the pressure of a spring which will cause such movable part to rotate around its hinge in the absence of the force of a vehicle leaning against the seat back when said operator is in a normal driving position.

3,866,724

VARIABLE TWO-WAY SHOCK ABSORBER

Harold S. Hollnagel, 918 W. Laramie Ln., Milwaukee, Wis. 53217

Filed Aug. 13, 1973, Ser. No. 387,938
Int. Cl. F16f *7/08*
U.S. Cl. 188—129 **30 Claims**



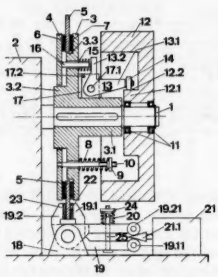
1. An energy absorbing device comprising: first and second relatively displaceable members adapted for independent connection to separate, external, relatively movable elements, friction means disposed between said members including at least one friction member, wedge means including a wedge member carried by one of said relatively displaceable members, resilient actuating means disposed between said friction member and said wedge member for moving said friction member into frictional engagement with the other of said relatively displaceable members, a wedge surface on said resilent actuating means defining a wedge angle engaged by said wedge member to change said wedge angle in proportion to the magnitude of force urging movement between said relatively displaceable members.

3,866,725

LOAD-DEPENDENT BRAKING DEVICE FOR CONVEYING SYSTEMS

Wilfried Greutter, Vienna, Austria, assignor to Inventio AG, Hergiswil, Switzerland

Filed July 23, 1973, Ser. No. 381,976
Claims priority, application Switzerland, July 26, 1972, 11239/72
Int. Cl. B60t *7/12*
U.S. Cl. 188—134 **12 Claims**



1. A load-dependent braking device for conveying systems comprising a primary brake possessing a fixedly adjusted braking moment, a secondary brake with a variable braking moment, the braking moment of the secondary brake being adjusted as a function of the loading moment acting upon a drive means for the attainment of a braking deceleration independent of load, the improvement comprising said primary brake having a rotatable brake part, the secondary brake having a fixed brake part and a rotatable brake part, the rotatable brake part of the primary brake being rigidly connected with the fixed brake part of said secondary brake, brake pad means, resilient means for exerting a spring pressure for urging the rotatable brake part of the secondary brake through the agency of the brake pad means against the fixed brake part of the secondary brake, setting cam means, a rod arrangement, means for providing a spring force for urging the rod arrangement against the setting cam means, said rod arrangement serving to lift-off the rotatable brake part of the secondary brake as a function of the change of speed which occurs upon braking of the drive means, said drive means including a drive shaft, a flywheel disk at which there is arranged said setting cam means, means for mounting said flywheel disk to be freely rotatable at the drive shaft, said setting cam means actuating the rod arrangement in opposition to the spring force in proportion to the angle of displacement between the flywheel disk and the drive shaft.

3,866,726

COUPLING WITH TILTABLE ELLIPTICAL DISC

Oskar Arenz, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Continuation of Ser. No. 245,313, April 19, 1972, abandoned. This application Apr. 2, 1973, Ser. No. 347,159
Int. Cl. F16d *67/02*
U.S. Cl. 192—6 R **13 Claims**

1. A wheel hub for a bicycle and like vehicle comprising, in combination:

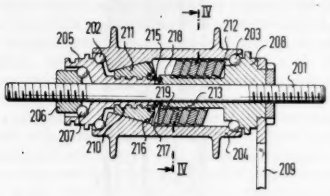
a. a normally stationary shaft having an axis;

b. a hub shell mounted for rotation about said axis and having an inner wall about said axis;

c. a driver rotatable about said axis in an axially fixed position, said driver having respective axial portions in said hub shell and projecting from said hub shell;

d. a tubular carrier member receiving a portion of said shaft in said shell;

e. first securing means for securing said carrier member against rotation about said axis;
f. a substantially rigid disc member;
g. second securing means securing said disc member on said carrier member against rotation on said carrier member about said axis while permitting tilting movement of said disc member in a plane including said axis toward and away from a position of locking engagement of said disc member with said inner wall; and
h. tilting means for tilting said disc member in said plane, said tilting means including

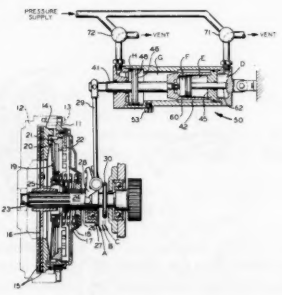


1. first abutment means axially secured relative to said shaft,
2. second abutment means, said first and second abutment means being offset from said disc member in opposite axial directions and from said axis in opposite radial directions for engagement with said disc member, and
3. threaded means threadedly connecting said second abutment means to said driver for axially moving said second abutment means toward and away from said first abutment means when said driver rotates about said axis in respective directions.

3,866,727
FLUID OPERATED CLUTCH AND BRAKE WITH DASHPOT

Gerald L. Myers, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 18, 1974, Ser. No. 434,532
Int. Cl. F16d *67/04*
U.S. Cl. 192—13 R **7 Claims**

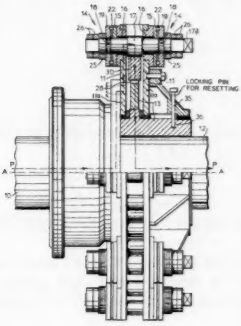


1. In a clutch including an input, an output, a brake, a shift means having first, second and third positions and wherein said input and output are connected when said shift means is in said first position and disconnected when said shift means is in said second and third positions and wherein said brake is actuated when said shift means is in said third position and an actuating means associated with said shift means the improvement wherein said actuating means comprises a cylinder having first, second and third pistons therein, said first piston being operatively connected to said shift means, said second piston being shiftable between a first position allowing travel of said first piston to said third position thereof, and a second position, limiting travel of said first position to said second position thereof, said third piston being adapted to allow free travel of said first piston from said first to said second and third positions thereof and to inhibit travel of said first piston from said second and third positions thereof.

3,866,728
OVERLOAD CLUTCH

Olaf John Barclay Orwin, Quinton, England, assignor to Gib Precision Limited, Cirencester, England

Filed May 24, 1973, Ser. No. 363,587
Claims priority, application Great Britain, May 26, 1972, 24852/72
Int. Cl. F16d *43/20*
U.S. Cl. 192—56 R **21 Claims**



1. In an overload clutch comprising a pair of rotatable members, disengageable drive means to transmit torque between said members, said drive means comprising a plurality of pairs of disengageable drive transmitting abutments and a plurality of torque limiters operative up to a predetermined torque to prevent disengagement of said drive transmitting abutments to enable transmission of torque between said members and operative above said predetermined torque to permit disengagement of said abutments to interrupt transmission of torque between said members, the improvement wherein each torque limiter comprises a pair of clutch elements, means mounting one element of each pair for overrunning movement relative to the other when more than a predetermined torque is applied and means preventing such overrunning movement until such torque is exceeded, comprising a plurality of restraining members adapted for rolling movement and maintained in restraining engagement with the torque limiter clutch elements by loading means and in which the abutments of each pair of drive transmitting abutments are mounted for mutual relative movement in a first path on said overrunning movement to permit disengagement of the abutments and for relative movement in said first path and a second, different path, to permit resetting of the torque limiters and re-engagement of the abutments after overload has occurred.

3,866,729
ELECTROMAGNETIC OPERATED CLUTCHES AND BRAKES

Josef Eichenhofer, Brampton, Canada, assignor to Automatic Research Development Co., Willoughby, Ohio

Filed June 13, 1973, Ser. No. 369,502
Int. Cl. F16d *27/04*; **B60l** *7/00*
U.S. Cl. 192—84 C **12 Claims**

1. An electromagnetically operated clutch or brake comprising:

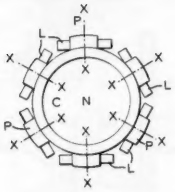
a first rotatable torque transmitting member defining a rotary axis,

first and second mutually engageable members adapted when engaged to transmit torque between said first rotatable torque transmitting member and a second torque transmitting member, and

an electromagnet having a core and a movable armature mounted coaxially with the first rotatable torque transmitting member, the armature being axially displaceable in relation to the core to effect engagement of said mutually engageable members,

the core being of annular configuration providing an annular end face, and having a plurality of radial pole pieces symmetrically arranged around said axis, and

the armature being of annular configuration providing a first face confronting the ends of said pole pieces and an



annular second face confronting said annular end face of the core.

10. In an electromagnetically operated clutch or brake having an electromagnet which is operable to effect engagement between first and second mutually engageable members for transmitting torque between respective torque transmitting members, the electromagnet comprising a core, a movable armature, and energizing means therefor, the improvement wherein said core is of annular configuration providing an annular end face, and has a plurality of pairs of symmetrically arranged, radially outwardly extending, pole pieces, the pole pieces of each pair being diametrically opposed, said armature being of annular configuration providing a cylindrical first face confronting the ends of said pole pieces and an annular second face confronting said annular end face of the core.

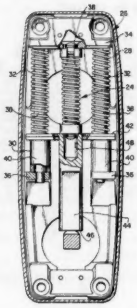
3,866,730

INACTIVE CASE FOR EMERGENCY EXIT BOLT

Walter O. Balducci, New Britain, Conn., assignor to Emhard Corporation, Bloomfield, Conn.

Filed Nov. 29, 1973, Ser. No. 420,282
Int. Cl. E05c *15/02*
U.S. Cl. 292—92 **5 Claims**

1. In an inactive case for an emergency exit bolt assembly and having a frame assembly including a frame, a slide, means supporting said slide on said frame for sliding movement relative thereto between a first and a second position, and means for biasing said slide toward said first position, the improvement comprising an auxillary spring unit for snap-in assembly with said frame assembly and including a compression spring, a support rod extending through said compression spring, and means for retaining said compression spring in a compressed condition on said support rod prior to snap-in assembly with said frame assembly, said auxillary spring unit



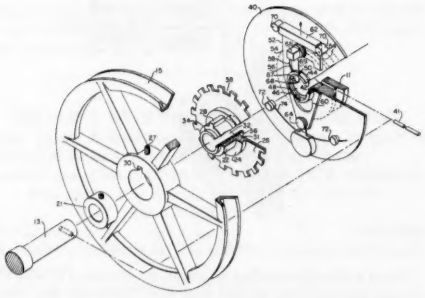
in assembly with said frame assembly providing additional biasing force for urging said slide toward said first position.

3,866,731

SPEED RESPONSIVE CLUTCH

George W. Nagel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 25, 1973, Ser. No. 382,422
Int. Cl. F16d *43/16*
U.S. Cl. 192—104 C **8 Claims**



1. A speed responsive clutch mechanism for effecting engagement or disengagement of a first drive means to a driven member, said driven member also drivingly coupled to a sec-

ond drive means and wherein said first drive means drives said driven member at a relatively low speed in relation to said second drive means, said mechanism comprising;

a first rotational plate drivingly coupled to one of said drive means;

a slide means including a projecting engagement means mounted on said plate for movement to a radially outer position from a first position in response to centrifugal force,

means biasing said slide to normally assume said first position,

a second rotational plate drivingly coupled to the other of said drive means; said second plate coaxial with said first rotational plate and defining means for drivingly engaging said engagement means when said slide is in said first position; said engagement means and said engaging means being disengaged with respect to one another when said slide it in said radially outer position; and

means resiliently biased to a position obstructing movement of said engagement means from said radially outer first position and normally in said position obstructing movement whenever the rotational speed of said first rotational plate is less than provides sufficient centrifugal force to maintain said slide in said radially outer position but greater than the rotational speed of said second plate said biased means subsequently forced to a nonobstructing position permitting said engagement means to move to said first position for driving engagement between said engagement means and said engaging means in response to the rotational speed of said first plate decreasing to a speed less than the rotational speed of said second rotational plate.

3,866,732

Patent Not Issued For This Number

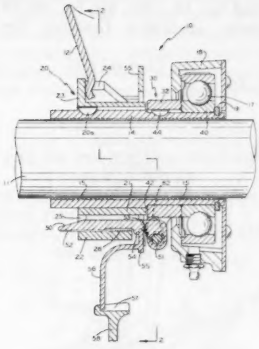
3,866,733

SELF-ADJUSTING RELEASE MECHANISM FOR FRICTION CLUTCHES

Donald F. Linn, Manlius, and George L. Wishart, North Syracuse, both of N.Y., assignors to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,769
Int. Cl. F16d *13/75*
U.S. Cl. 192—111 A **5 Claims**

1. In a friction clutch for connecting driving and driven shafts, the clutch having means for normally effecting a driving connection between the shafts and release levers actuatable to disengage said driving connection, the improvement comprising an inner sleeve member axially slidable on the driven shaft, an outer sleeve member axially slidable on the inner sleeve, means on one of said sleeve members engageable with the release levers for actuation of same, a jaw having a gripping surface, means to pivotally connect said jaw to one of the sleeves, a gripping surface on the other sleeve which is normally gripped by the jaw whereby axial movement of the one sleeve member in one direction operates to correspondingly move the other sleeve and actuate the release levers, and means for releasing said jaw from said gripping surface, the release means being operable when the wear on the clutch driving connection reaches a particular point to permit relative axial movement between sleeve members to compensate for the wear.

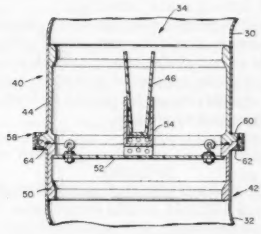


3,866,734

DOUBLE CHECK VALVE BETWEEN SEPARABLE INFLATABLE UNITS

Paul A. Elkins, Palos Verdes Peninsula, Calif.; Ralph A. Miller, New Monmouth, N.J., and Lawrence E. Scheer, Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 15, 1973, Ser. No. 388,708
Int. Cl. A62b *1/20*
U.S. Cl. 193—25 B **14 Claims**



7. A double check valve disposed between an inflatable ramp disposed at an elevated egress and a separable inflatable evacuation slide and raft in fluid communication therewith extending from the inflatable ramp to a surface below the elevated egress, comprising:

a first check valve operably associated with said inflatable ramp;

a second check valve operably associated with said inflatable evacuation slide and raft;

means to operably connect said first check valve to said second check valve, said second check valve including means to maintain said first check valve in an open position when said first and second check valves are operably connected; and

means to quickly disconnect said first check valve from said second valve when the inflatable slide and raft is separated from the inflatable ramp.

3,866,735

ROTATIONAL POSITIONING MECHANISM FOR SINGLE ELEMENT PRINTER

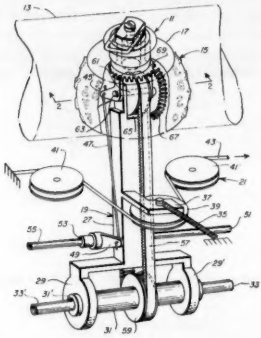
Herbert Decker, Lauf, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Oct. 18, 1973, Ser. No. 407,551

Claims priority, application Germany, Oct. 26, 1972, 2252447

Int. Cl. B41j *1/32*

U.S. Cl. 197—55 **4 Claims**



1. In a printing machine having a hollow downwardly open cup-shaped typehead on which a plurality of type characters are located in columns and rows on its outer periphery, said typehead being adapted to be rotatably positioned about a rotate axis to select a column of type characters and to be tiltably positioned about a tilt axis to select a row of type characters, comprising,

support means extending into the hollow interior of said typehead for supporting said typehead for movement about an external axis to effect printing of a type character at a selected row and column location,

a first shaft defining said external axis,

a second shaft parallel to said first shaft rotatably supported on the portion of said support means within said typehead, said second shaft defining said tilt axis,

a tilt frame pivotally supported on said second shaft,

a first gear rotatably supported on said tilt frame and having its axis along said rotate axis,

means securing said typehead to said first gear,

a second gear secured to said second shaft meshing with said first gear,

a first pulley rotatably mounted on said first shaft,

a second pulley secured on said second shaft,

drive means comprising a belt trained around said first and second pulleys to rotatably position said typehead about its rotate axis,

and means for rocking said tilt frame about said second shaft to select a row of type characters without twisting movement of said belt.

3,866,736

MANUAL TYPEWRITER WITH MEANS FOR ERROR CORRECTION

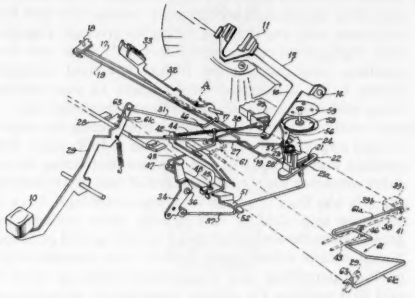
Chester E. Ozimek, Park Ridge, and Kenneth L. Eldridge, Jr., Naperville, both of Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.

Filed Aug. 6, 1973, Ser. No. 386,203

Int. Cl. B41j *29/36*

U.S. Cl. 197—181 **1 Claim**

1. In an error correcting typewriter comprising character printing mechanism including printing control keys operatively connected to type bars, paper support mechanism, spacing means including an escapement arch operatively engageable by said type bars for stepwise moving said paper support mechanism in a forward direction to accomplish printing a line of characters, a ribbon providing a printing field and a print obliterating field, a pivotally mounted ribbon vibrator having a depending arm and actuated by the printing control keys to guide said ribbon to bring a ribbon field momentarily in impressing position, inhibiting means comprising a slidable member disposed in the path of travel of said arm to limit the movement of said ribbon vibrator, back space drive means for stepwise moving said paper support mechanism in a backward direction in letter width increments, the



improvement which comprises a manually operable key connected to a special type bar carrying a universal obliterating type font, said special type bar being free of any engagement with said escapement arch whereby upon actuation of said manual key the paper support mechanism is not moved, a link operatively connected to said manual key for moving said slidable member out of the path of travel of said arm whereby upon actuation of said manual key the ribbon vibrator is caused to elevate the print obliterating field into impressing position to be impinged upon by said type font to obliterate a character imprinted in error.

3,866,737

METHOD AND APPARATUS FOR THE CONTINUOUS TRANSFER OF LONGITUDINALLY EXTENDING WORKPIECES

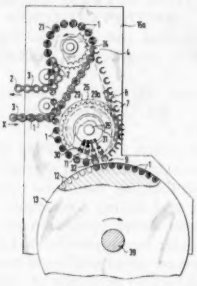
Stefan Simon, Moedling, Niederosterreich, Austria, assignor to Dr. Carl Hahn GmbH, Dusseldorf, Germany

Filed Jan. 10, 1972, Ser. No. 216,624

Claims priority, application Germany, Jan. 15, 1971, 2101932

Int. Cl. B65g *47/00*

U.S. Cl. 198—22 R **12 Claims**



1. An apparatus for the continuous transfer of longitudinally extending tampons of compressed absorbent fiber material of like dimension to a high-speed receiver means, which apparatus comprises a driveable shaft carrying a first transfer drum

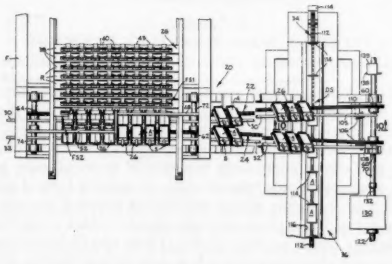
disposed theeabout, said transfer durm provided with at least one transfer mandrel, means for displacing said transfer mandrel concentrically and longitudinally parallel to the drum axis, a chain-like element provided with sleeve-like tampon receiver means, said receiver means forming extensions of hollow hinge pins, said sleeve-like receiver means extending from the chain in the direction of a workpiece carrying means, an endless transfer element having mounted thereon workpiece carrying means having a slot therein, each of which workpiece carrying means is in the form of a trough-like member having an inside cross section smaller than the cross section of the tampon to be carried and elastic long sides forming clamping jaws which can enclose around the tampon to a point above a longitudinal axis through its center, said workpiece carrying means at least at its end remote from and facing said first transfer drum being closed to substantially the full height of the tampon to be carried so that the closed end of the workpiece carrying means facing said first transfer drum, in the transfer position thereof, forms a substantially closed transfer passage with said receiver means, a second transfer drum carrying said endless transfer element, said chain-like element and said endless transfer element trained with respect to one another, said transfer mandrel and said means for displacing said transfer mandrel such that in the area of end-to-end alignment of said receiver means with said workpiece carrying means said means for displacing said transfer mandrel moves said transfer mandrel concentrically and longitudinally parallel to said drum axis whereby said transfer mandrel transfers a tampon from said receiver means to said workpiece carrying means, said apparatus having a reversing shaft on which said second transfer drum is mounted rigidly said second transfer drum carrying, at least in part, said endless flexible element, said second drum provided with transfer push-rods mounted at identical angular distance and means for displacing said push-rods radially outward through a slot in the workpiece carrying means, a revolvable drum having depressions provided on the periphery thereof, said drum disposed in facing relationship to said second transfer drum whereby tampons can be serially ejected from said workpiece carrying means into said depressions.

3,866,738

ARTICLE TRANSFER MECHANISM

John S. Aterianus, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 21, 1973, Ser. No. 399,572
Int. Cl. B65g *47/38*
U.S. Cl. 198—27 **12 Claims**



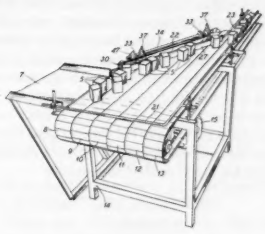
1. An apparatus for transferring elongated articles having longitudinal axes and predetermined lengths at high speed from a multi-lane driven inlet conveyor which supports the articles with their longitudinal axes vertical and spaced apart a distance less than the length of the articles to a single lane output conveyor with the longitudinal axes being horizontal and the spacing between articles being greater than the length of the articles comprising, a pair of spaced transfer conveyors disposed transversely of the inlet and outlet conveyors, means for effecting transfer of articles from a predetermined plurality of lanes of multi-lane inlet conveyor into one of said transfer conveyors and for effecting transfer of the articles from other predetermined lanes of the inlet conveyor into the other transfer conveyor, means on said transfer conveyors for supporting and shifting the articles from a vertical to a horizontal position and advancing the articles until the articles are aligned with said single lane output conveyor, means for simultaneously transferring one article from each transfer conveyor into the single lane output conveyor, and drive means for driving each of said conveyors in timed relation.

3,866,739

FREE FLOW DEVICE FOR CONTAINER UNSCRAMBLERS

Thaddeus John Sikorski, Park Ridge, Ill., assignor to Standard Metal Products, Franklin Park, Ill.

Filed Feb. 28, 1973, Ser. No. 336,450
Int. Cl. B65g *47/26*
U.S. Cl. 198—30 **12 Claims**



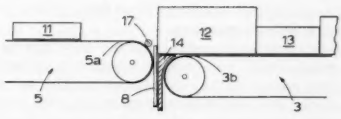
1. Apparatus for unscrambling containers, comprising:
a take away conveyor;
a shunting bar converging toward said take away conveyor;
means for conveying containers to and along the shunting bar toward the take away conveyor;
means for vibrating the shunting bar to assure free flow movement of the containers from the bar onto the take away conveyor; and
means on the bar for effecting spinning of the containers which contact the bar by being propelled theretoward by said conveying means, and wherein said means for effecting spinning comprises a frictional cushioning strip attached to and providing a facing of substantial thickness along the bar for engagement by the containers.

3,866,740

METHOD OF FEEDING DISCRETE ARTICLES FROM A STORAGE LOCATION AND A MACHINE THEREFOR

Thomas William Greathead, Billericay, England, assignor to The Post Office, London, England

Filed July 5, 1972, Ser. No. 269,209
Claims priority, application Great Britain, July 6, 1971, 31756/71
Int. Cl. B65g *47/26*
U.S. Cl. 198—34 **4 Claims**



1. A system for feeding discrete articles of diverse shape and size from a first work station to a second work station at which the articles are processed sequentially in an operation which takes a randomly variable time; said system comprising first conveying means for conveying the articles along a path from

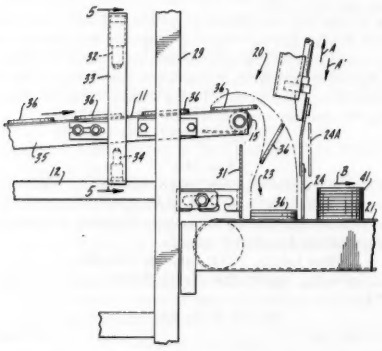
the first work station to a storage location; second conveying means for conveying the articles from the storage location to the second work station, each of said first conveying means and said second conveying means having a start and an end with the end of the first conveying means being adjacent to the storage location; a barrier interjacent the end of the first conveying means and the start of the second conveying means, means for moving the end of the first conveying means, transversely of said path, relative to the barrier between a first relative position in which the barrier is clear of said path and transfer of an article from the first conveying means to the second conveying means is permitted and a second relative position in which the barrier blocks said path and said transfer is prevented; intermediate conveying means located between the barrier and the start of the second conveying means above the level of the barrier to be engageable with each article during transfer thereof and arranged to be driven at a rate sufficient to convey the article being transferred towards the start of the second conveying means faster than the first conveying means conveys articles thereon towards the storage location thereby to effect separation between the article being transferred and other articles on the first conveying means; and control means for controlling the relative position of the barrier and the end of the first conveying means, said control means being operable at the second work station to cause the barrier and the end of the first conveying means to assume their first relative position and sensing means arranged to sense said separation and cause the barrier and the end of the first conveying means to assume their second relative position whereby the articles are transferred seriatim.

3,866,741

STACKER AND METHOD OF STACKING FROZEN FOOD PATTIES

Thomas J. Carbon, Addison; Josef T. Zeisberger, Chicago; Louis R. Richards, Mokena, and Henry N. Lekan, Chicago, all of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed June 21, 1973, Ser. No. 372,236
Int. Cl. B65g *57/00*
U.S. Cl. 198—35 **10 Claims**



1. A stacker for stacking frozen food patties or like disc-shaped articles, comprising:

a substantially horizontal input conveyor, having a terminal end located at a stacking station for conveying frozen food patties or like disc-shaped articles to the stacking station at a predetermined speed and with predetermined minimum spacing, the input conveyor discharging the articles, in free fall, over its terminal end;

a normally stationary stacking conveyor, extending outwardly of the stacking station from a stacking location at a point directly below the terminal end of the input conveyor, the vertical distance from the terminal end of the input conveyor to the stacking conveyor being sufficient to allow each article to rotate through an angle of about 180° as it falls toward the stacking conveyor;

a guide, movable between a stack guidance position adjacent the stacking conveyor and a stack release position displaced upwardly from the stacking conveyor and outwardly from the stack guidance position, for guiding the articles to accumulate in an orderly stack on the portion of the stacking conveyor at the stacking location;

stacking conveyor actuating means for actuating the stacking conveyor for a limited time interval, not substantially greater than the time interval between discharge of successive articles into the stacking station, to transport an accumulated stack of articles away from the stacking location;

guide actuating means for actuating the guide from stack guidance position to release position and back again in timed relation to operation of the stacking conveyor actuating means, the guide returning to stack guidance position before more than one article for the next stack reaches the stacking conveyor;

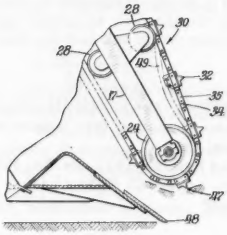
and means to monitor article accumulation at the stacking location and to energize both of said actuating means when a desired accumulation has been attained.

3,866,742

ANTI-KINK AND ROLLBACK DEVICE FOR ELEVATING SCRAPERS

Gary P. Freese, and Ronald E. Sarff, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 18, 1972, Ser. No. 316,049
Int. Cl. B65g *19/00*
U.S. Cl. 198—175 **5 Claims**

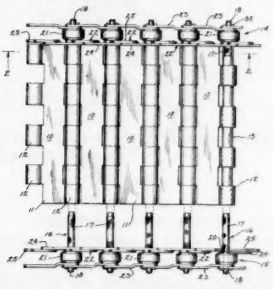


1. In a chain and flight assembly consisting of a plurality of flight members and a plurality of chains, at least one flight member extending between the chains, said flight member pivotally associated through link pins with a plurality of chain links, said chains comprising two parallel series of inner and outer overlapping side bars pivotally connected by said pins, and further including means for limiting rollback as well as back-flexing of the chain, said last named means comprising two pairs of stops mounted on said at least one flight member, each of said stops including a first stop surface thereon positioned so as to contact associated chain links and thereby limit back-flexing of the chain, a second stop surface thereon positioned so as to contact associated chain links and thereby limit rollback of the chain, and wherein said second stop surface is angled with respect to said first stop surface, and wherein each flight member comprises a baseplate and wherein said stops are located thereon with two pairs of spaced stops secured to each baseplate in line with the inner side bars so as to be adapted to be in contacting relation therewith and thereby limit rollback as well as back-flexing of the chain.

3,866,743
HINGED METAL BELT CONVEYOR

Charles T. Jorgensen, 6046 Lake Worth Rd., Box 946, Lake Worth, Fla. 33460

Filed July 20, 1973, Ser. No. 381,215
Int. Cl. B65g 15/30
U.S. Cl. 198—195 5 Claims



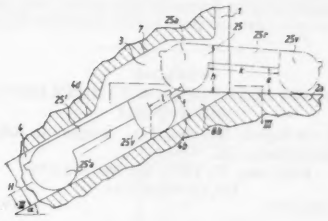
1. A metal belt conveyor comprising:
a hinged apron belt assembly comprising a plurality of conveyor plate sections, hinge loops carried by the ends of said sections with the loops of adjacent sections in transverse alignment, and hollow hinge rods extending through said loops;
and left and right hand roller chain assemblies each comprised of
a plurality of shafts each having a mounting portion, a projecting portion adapted to be inserted and held within the open end of one of said hinge rods, and a shoulder separating said mounting and projecting portions,
said roller chain assemblies being joined to said belt assembly solely by the engagement of said projecting portions within the open ends of said hinge rods;
a side wing mounted on the mounting portion of each pair of adjacent shafts with adjacent side wings overlapping each other,
a roller received on the mounting portion of each shaft,
and restraining means disposed adjacent the end of each mounting portion opposite said shoulder, said restraining means cooperating with said shoulders to prevent axial withdrawal of the side wings and rollers from said mounting portions.

3,866,744
DUCT FOR FILM-CONTAINING CASSETTES

Klaus Klose, Holzkirchen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 20, 1973, Ser. No. 399,181
Claims priority, application Germany, Sept. 22, 1972, 2246524
Int. Cl. B65g 11/20
U.S. Cl. 198—278 7 Claims

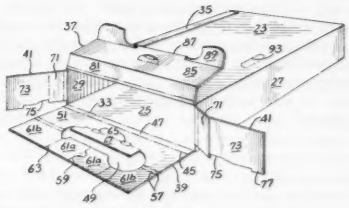
1. A duct for substantially U-shaped film-containing cassettes of the type having a first leg constituting a supply section, a second leg constituting a takeup section and having a width exceeding that of said first leg, and a web constituting an intermediate section, said duct including wall means defining a channel having an inlet and a main portion communicating with said inlet, said inlet being configurated to allow therein the passage of cassettes in a plurality of different orientations and said wall means being provided with restricting means located in the region of said inlet and arranged to permit cassettes to pass through said inlet and into said main portion of said channel only in a single predetermined orientation of cassettes during introduction into said inlet, a U-shaped cassette being in said single predetermined orientation when said second leg is located ahead of said first leg, as considered in the direction of introduction into said channel and said first and second legs extend downwardly from said web, said wall means having surfaces bounding said inlet of said channel and one of said surfaces including a pair of ramps over which said second leg of a cassette slides during introduction into said inlet, said ramps forming part of said restricting means and being spaced apart by a distance exceeding the width of said first leg of a U-shaped cassette so that such first leg can travel between said ramps during introduction of the respective cassette into said channel.



3,866,745
FIBERBOARD CONTAINER FOR PACKAGING AN ARTICLE

Joseph J. Dlugopolski, Lombard, Ill., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Dec. 18, 1972, Ser. No. 316,110
Int. Cl. B65d 25/10
U.S. Cl. 206—45.14 10 Claims



1. A partially folded paperboard container blank for packaging a flanged article having a surface extending transversely from the flange thereof, which blank comprises
a tubular body section proportioned to receive the flanged article and having top and bottom panels and a pair of side panels,
end closures at each end of said tubular body section for closing the openings thereinto,
at least one of said end closures having upper and lower flaps attached respectively to said top and bottom panels, one of said flaps being constructed to extend into said body section in overlying relationship to a portion of the flange of the article and having an edge which is shaped to lie in generally abutting relationship with the transverse surface of the article when the closure is completed, at least one of said side panels extending perpendicular to said top and bottom panels when set up to receive a flanged article, said one side panel having a side flap hinged thereto which forms a part of said one end closure, said side flap having a first panel adapted to extend into said tubular body section and a second panel hinged thereto for extension toward said other side panel, said second panel having a locking tab located for insertion between said shaped edge of said one flap and the trans-

verse article surface when said one end closure is completed, and

the other of said upper and lower flaps including a subpanel adapted to extend into said body section and a main panel hinged thereto for disposition extending generally transverse to and between said top and bottom panels, said main panel having means for engagement with said one flap to lock said main panel in said transverse disposition.

3,866,746

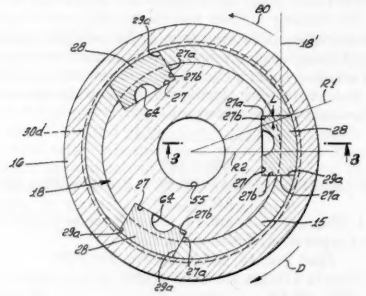
ROTARY BORE HOLE AIR HAMMER DRIVE MECHANISM

Alfred R. Curington, Houston, Tex., assignor to Bakerdrill, Inc., Spartanburg, S.C.

Filed Aug. 27, 1973, Ser. No. 392,076

Int. Cl. E21c *1/12*

U.S. Cl. 173—73 **19 Claims**



1. In hammer drilling apparatus comprising: a housing structure connectible to a drill string and including a housing section and a drive member detachably secured to and surrounded by said housing section; an anvil in the housing structure; a piston reciprocable in said housing structure for intermittently impacting against said anvil; said anvil having a plurality of circumferentially spaced, longitudinal recesses formed by side walls disposed on generally radial opposed planes; said drive member having circumferentially spaced openings therein extending completely through said drive member, said openings also being formed by side walls disposed on generally radially opposed planes; drive segments in said recesses and openings and having side walls engaged by said walls of said anvil and said drive member; said housing section surrounding said drive member, openings and segments to close said openings, said housing section engaging said segments to retain said segments in said recesses and openings.

3,866,747

CIGARETTE CASE

William A. Scholz, 555 Armsley Sq., Ontario, Calif. 91761

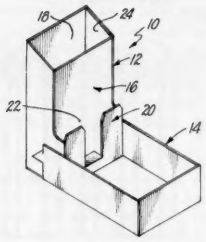
Filed Jan. 10, 1973, Ser. No. 322,389

Int. Cl. A24f *15/18*; **B65d** *85/10*

U.S. Cl. 206—94 **15 Claims**

1. A cigarette case for containing a cigarette pack and an additional article such as a match book, lighter, keys or the like, comprising:

a hollow rectangular body having front and rear side walls, edge walls and a bottom wall joined to one another along their edges to form a first rectangular pocket opening through the upper end of said body for receiving a cigarette pack, portions of said edge and bottom walls extending forwardly beyond said front side wall, and an additional wall extending between said edge wall portions forwardly of and in spaced parallel relation to said front wall and joined along its edges to said edge and bottom wall portions to form with said wall portions and said front side wall a second upwardly opening pocket located at the front side of said front side wall and externally of said first pocket for receiving said article,



a cover, and

hinge means joining said cover to said body for movement between a closed position wherein the cover closes the top opening of said first pocket and open position wherein said top opening is uncovered.

3,866,748

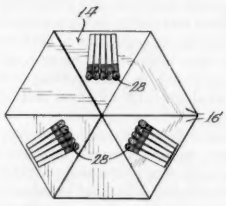
MEANS FOR CARRYING AND DISPLAYING ARTICLES

Robert A. Manning, Jr., 4714 Lee St., Downers Grove, Ill. 60515

Filed June 20, 1972, Ser. No. 264,633

Int. Cl. A24f *27/00*; **B65d** *73/00*; **A63h** *33/00*

U.S. Cl. 206—111 **4 Claims**



1. Means for carrying articles comprising a flexible device comprising a plurality of hingedly connected panels folded in a twisted closed loop in a substantially planar configuration, said device being manipulable to reversibly locate certain panels facing outward with certain other panels facing one another, and a substantially thin and flat article mounted on one of said facing panels and being entirely hidden from view, said device being manipulable to expose said article.

3,866,749

HOLDER FOR GOLF BALL POSITION MARKER AND A MARKER THEREFORE

Arthur Thomas Stainer, Poole, England, assignor to Jack Smith (Gunmakers) Limited, Poole, Dorset, England

Filed Apr. 10, 1973, Ser. No. 349,863

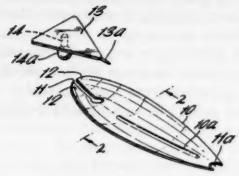
Claims priority, application Great Britain, Apr. 10, 1972, 16426/72

Int. Cl. A63b *57/00*; **B43k** *29/00*; **B65d** *85/54*

U.S. Cl. 206—234 **2 Claims**

1. In combination a holder for a golf ball position marker and a marker therefore, wherein the holder comprises an elongated member provided with ends, a recess formed in one end and wherein said maraker comprises a substantially flat head portion and a stem member provided on one side of the head portion, said stem member being received in the recess

in the holder, said marker having means to retain the marker in a detachable manner on the holder, and wherein the head



portion of the marker is provided with a writing means extending from a side edge thereof.

3,866,750

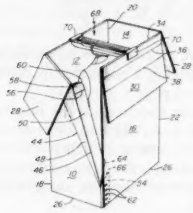
SHIPPING WARDROBE

Herbert S. Collin, c/o Collin Box & Supply Co., Newton, Mass. 02118

Filed Dec. 10, 1973, Ser. No. 423,204

Int. Cl. B65d *85/18*

U.S. Cl. 206—290 **5 Claims**



1. A storage and shipping wardrobe comprising:

a pair of sidewalls, a rear wall and a front wall arranged in a rectangular configuration;

flap means connected to the bottom edge of each of said walls and being constructed to be foldable to define a bottom for said wardrobe;

at least one of said side panels having a flap formed along the upper edge thereof, said flap being foldable at least in part downwardly along the outer surface of said side panel to define a gripping handle having a slot which is exposed at least at the front of said wardrobe;

said front wall of said wardrobe having a door hinged along a hinge line, said door having a free edge which, when said door is closed, lies adjacent the front edge of said at least one panel, said door having a tongue formed along said free edge thereof, said tongue being hinged to said door and disposed at a location to enable said tongue to be inserted exteriorly of said sidewall and into said slot when said door is closed.

3,866,751

BOOK WITH CASSETTE HOLDING RECESS

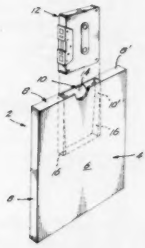
Donald C. Holert, 3915 S.W. Monroe, Seattle, Wash. 98116

Filed Apr. 24, 1972, Ser. No. 247,140

Int. Cl. B65d *79/00, 81/00, 85/67*

U.S. Cl. 206—387 **7 Claims**

1. In combination, a tape cassette, and a flat, stiff, discrete, hollow, broad-profiled, narrow-edged case which is adapted to stand upright on edge without lateral support, and which has a quadrilateral outline about the profile thereof, and oppositely disposed faces thereon which are spaced apart by substantially the edgewise thickness of the cassette, and which coterminate with one another at the outline of the case and define the edges of the case therebetween, the profile dimensions of the case being adapted so that the case is readily perceivable and graspable in the manner of a book, on and from a shelf, and the cassette being removably inserted in the case adjacent one edge thereof, in a profile portion of the case constituting a minor fraction of the profile area of the case, and there being an opening in the one edge of the case which is in registry with the cassette and adapted so that the cassette can be passed edgewise into and out of the case therethrough,



and means disposed in the case about the cassette, which are operative to define a trapezoidally cross-sectioned recess in the case adjacent the opening in the one edge thereof, the non-parallel walls of which recess are formed by a pair of wedge-shaped members which are secured in the case at the recess and yieldably constructed to interengage with the cassette upon the insertion thereof to releasably retain the cassette in the case when the opening is downwardly oriented.

3,866,752

INCLINED ENDLESS SCREEN BELT WITH TRANSVERSE BAR

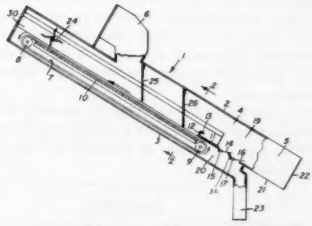
Oliver K. Hobbs, Box 1306, Suffolk, Va. 23434

[*] Notice: The term of this patent subsequent to June 6, 1991 has been disclaimed.

Continuation of Ser. No. 882,846, Dec. 8, 1969, Pat. No. 3,667,599. This application Jan. 20, 1972, Ser. No. 219,452

Int. Cl. B03b *7/00*

U.S. Cl. 209—12 **9 Claims**

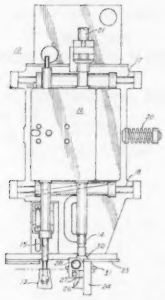


1. An apparatus for separating particles which will roll from particles which will slide down an incline comprising a continuous belt looped about longitudinally spaced rollers, said belt having an inclined upper reach with one end elevated above the other end and a surface adapted to support said particles, means for driving the belt with the upper reach moving towards its elevated end, said surface having upstanding ribs with spaces therebetween adapted to trap only some of said particles, an upstanding bar disposed across the belt adjacent to its said other end which prevents particles from sliding from the said other end of the belt but permits rollable particles to roll thereover, and means for collecting all of the particles which roll over the said bar.

3,866,753
BOTTLE HEIGHT INSPECTION APPARATUS

Colin Milton, Thornton, Colo., assignor to Columbine Glass Company, Inc., Wheat Ridge, Colo.

Filed Sept. 26, 1973, Ser. No. 400,890
Int. Cl. B07c
U.S. Cl. 209—73 6 Claims



1. In a machine for the continuous testing on a production line of bottles of substantially uniform size including means for moving the bottles in line at the same rate and at equal spacing and a test head for effecting a test of a bottle characteristic moved axially into engagement with each bottle in turn at a test position and moving laterally forward along the line in engagement with the top of the bottle for a predetermined stroke during the test period and then being withdrawn, and means positioned along the line of bottles for ejecting each defective bottle, a device for testing the height of each bottle in turn which comprises:

a magnetic probe mounted in a predetermined position on said machine and having a sensing axis transverse to the line of bottles and laterally forward of said test position within the length of said predetermined stroke,

a magnetic member on the test head positioned to be spaced from said sensing axis of said probe when said test head moves laterally into engagement with a bottle having a predetermined acceptable height and said member lying in the path of said probe axis when said head engages a bottle having a predetermined different height during said stroke, said magnetic member being a ring mounted on said head concentrically about the central axis thereof whereby rotation of the head on its axis does not affect the minimum spacing between said member and said probe, and

means responsive to the magnetic sensing of the proximity of said magnetic member for preparing and actuating said bottle ejecting means to eject the different height bottle from the line.

3,866,754
PELLET SEGREGATION AND APPARATUS THEREFOR

David Evans, Swansea, Wales, assignor to The International Nickel Company, Inc, New York, N.Y.

Division of Ser. No. 156,288, June 24, 1971, Pat. No. 3,722,464. This application Nov. 21, 1972, Ser. No. 308,309
Claims priority, application Great Britain, July 7, 1970, 32963/70
Int. Cl. B07c ; B07b *13/10*
U.S. Cl. 209—73 5 Claims

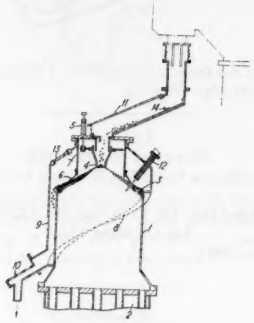
1. A pellet classifier comprising:

a. an open-topped reservoir having a continuous periphery;

b. feeding means including a nozzle for feeding a mixture of oversized and undersized pellets to the reservoir center to fill the reservoir and for forming a pellet pile having a conical surface, apex upwards, so that oversized pellets flow over the conical surface and over the reservoir periphery while undersized pellets become lodged in interstices in the conical surface;

c. at least one energy absorbing flexible curtain surrounding the nozzle, between the feeding means and the reservoir periphery for slowing the flow of pellets down the conical surface, thereby increasing the chance of lodging undersized pellets in the interstices in the conical surface;

d. a plurality of outlet means in the bottom of the reservoir for removing pellets from the reservoir to maintain the height of the pellet pile substantially constant;



e. adjustable dam means mounted on the reservoir periphery for maintaining a substantially horizontal dam over which oversized pellets overflow;

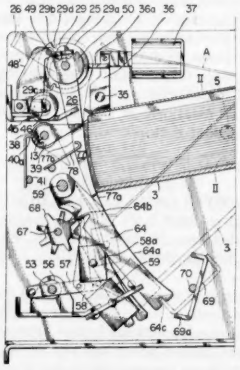
f. collecting means surrounding the reservoir periphery for collecting pellets overflowing the reservoir periphery; and

g. a screen for screening pellets overflowing the reservoir periphery into oversized and undersized pellets and means for recirculating the undersized pellets to the feeding means.

3,866,755
INFORMATION CARD SELECTION AND RETRIEVAL METHOD AND APPARATUS

Nobuyuki Yanagawa, Tokyo, Japan, assignor to Richo Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,193
Claims priority, application Japan, Dec. 28, 1972, 47-130176
Int. Cl. B07c *3/10*
U.S. Cl. 209—80.5 15 Claims



1. An information card selection and retrieval apparatus comprising:

a cassette for containing a stack of information cards each having an edge coded with at least one notch and containing magnetic material, the coded edges of the cards facing in the same direction and protruding from the cassette;

a tray for fixedly mounting the cassette and means for moving the tray pivotally about an axis parallel to the coded edges of the cards between a lowermost position at which the coded edges of the cards are at a lowermost position and are substantially lower than the opposite edges thereof and upper positions;

a plurality of selector bars disposed to face the coded edges of the cards in the lowermost position of the tray, each selector bar movable between an ON position to abut said coded edges and an OFF position away from the coded edges, each selector bar being narrower than a notch;

settable means for disposing at least one selector bar in its ON position;

selector magnet means and means for moving the magnet means against the coded edges of the cards while the tray is in its lowermost position to couple magnetically with the magnetic material of the cards and for subsequently moving the magnet means away from the cassette to thereby move therewith to a selected position partly out of the cassette each card whose notch coding is registered with said at least one selector bar in the ON position while the other cards are prevented from such movement by the lack of registration between their notch coding and the at least one selector bar in the ON position;

means for subsequently pivoting the tray upwardly; and

means for engaging each selected card in the selected position to withdraw it further from the cassette.

3,866,756

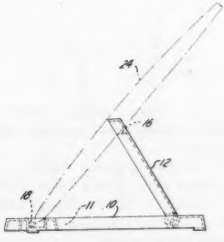
PEN STAND

James G. Moore, Cedar Rapids, and Fay W. Oltman, Anamosa, both of Iowa, assignors to Souvenir/Inc., Cedar Rapids, Iowa

Filed Jan. 2, 1974, Ser. No. 429,875

Int. Cl. B43k *23/04*

U.S. Cl. 211—69.5 **5 Claims**



1. A pen stand including a base and a pen-rest, the base comprising a frame having an opening that receives and surrounds the pen-rest in a collapsed condition of the pen stand, means at one side of the frame for securing one end of the pen-rest to the base, said pen-rest having a pen-receiving and locating formation at a portion thereof remote from its secured end for receiving and locating a portion of a pen spaced substantially from the writing tip thereof, the part of the frame remote from said one side thereof having a writing tip locating formation for locating the writing tip of a pen, said writing tip locating formation being adjacent the pen-receiving and locating formation of the pen-rest when the latter is disposed in the frame.

3,866,757

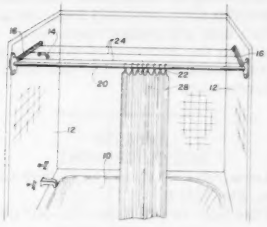
CLOTHES DRYER FOR BATHROOMS

John R. Lund, 419 Markham Rd., Scarborough, Ontario, Canada

Filed Sept. 14, 1973, Ser. No. 397,343

Int. Cl. A47h *1/02*

U.S. Cl. 211—105.1 **3 Claims**



1. In combination with a bathtub shower extending between first and second parallel vertical walls, a shower head extending out of one of said walls

first and second horizontally elongated brackets lying in a common horizontal plane disposed above the head, each bracket being secured to a corresponding wall, each bracket having at a corresponding end rod supporting means;

a horizontal curtain rod overlying the front edge of the tub, said rod being supported at each end by a corresponding one of the rod supporting means and extending between the brackets; and

a plurality of horizontal parallel wires which are plastic coated and which are coplanar with and parallel to said rod, each wire being secured at each end to a corresponding bracket and extending tautly therebetween.

3,866,758

FRAME WORK

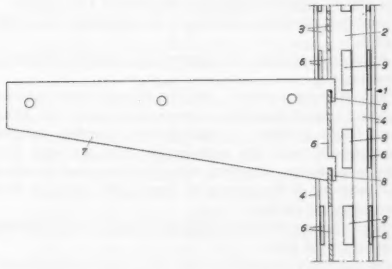
Marcel R. Strassle, Rosenberg, 9533 Kirchberg, Switzerland

Filed Apr. 16, 1973, Ser. No. 351,484

Claims priority, application Switzerland, Apr. 14, 1972, 5524/72

Int. Cl. A47f *5/08*

U.S. Cl. 211—107 **5 Claims**



1. A framework having at least one support column and a bracket adapted to be engaged thereto comprising: a tubular support column with a substantially rectangular or square cross-section and a plurality of vertical bridge-elements projecting outwardly therefrom; each of said bridge-elements carrying a flat rail disposed substantially parallel to a wall face of said tubular column; at least some of the bridge-elements having first vertically aligned slot-like orifices; least one wall face of said tubular column having similarly disposed second

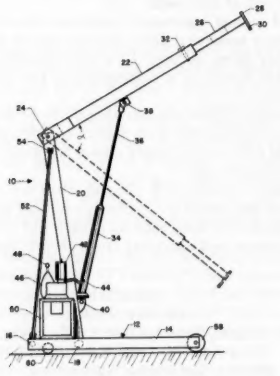
vertially aligned slot-like orifices; said first and second slot-like orifices of said bridge-elements and said wall face residing in perpendicular planes; whereby said bracket may be engageable with said first and second slot-like orifices, said bracket including hook means adapted to engage either said first or second slot-like orifices with the width of said slot-like orifices being substantially equal to the thickness of said hook means, adjacent rails defining an intermediate space for the passage of said bracket extending outwardly from engagement with a slot-like orifice, said intermediate space having a width substantially equal to the thickness of said bracket, said rails thereby limiting lateral movement of said bracket extending outwardly therebetween.

3,866,759

PORTABLE HOIST

Charles M. Lucas, c/o Gold Coast Corp., 2990 Griffin Rd., Ft. Lauderdale, Fla. 33312

Filed Nov. 16, 1972, Ser. No. 307,008
Int. Cl. B66c *23/06*
U.S. Cl. 212—8 R **1 Claim**



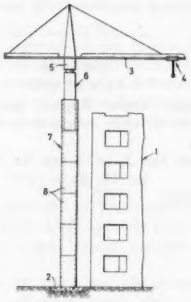
1. A portable crane comprising:
a structural frame;
a first pair of wheels coupled to one end of said frame;
a second pair of wheels coupled to the opposite end of said frame;
said frame comprising a first pair of rigid parallel structural members;
first pair of cross-members, the first of said cross-members coupled perpendicularly at one end of each said structural frame member, a second cross-member coupled substantially near the mid-section between said first structural frame members whereby the cross-members and portions of the structural frame side members form a rectangular portion;
a vertical support member obliquely coupled to said middle cross-member bar;
a boom rotatably coupled to one end of said vertical structural member;
boom lifting means obliquely coupled to said boom and said vertical support member for moving the boom through an angular distance;
extension means coupled within said boom for extending the length of said boom;
lifting means coupled to the end of said boom extension for coupling to an object to be lifted;
means for locking at least one of said wheels to prevent rotational motion of said wheel relative to said structural frame;
said boom lifting means includes a hydraulic chamber, a hydraulic piston moveably engaged within said chamber, a structural member coupling said piston to said boom;
means for providing hydraulic fluid into said piston chamber for raising said boom;
said hydraulic means includes an electric motor, said motor connected to hydraulic pump, and a hydraulic fluid reservoir coupled to said pump and into said piston chamber, said hydraulic chamber coupled at one end to said vertical supporting structure and at the other end to a midpoint on said boom; and
a pair of supporting rails, each of said rails coupled obliquely at its lower end to said frame and at its upper end to the lateral side of said vertical support member.

3,866,760

ROTARY TOWER CRANE

Elmar Reich, Biberach, Germany, assignor to Hans Liebherr, Biberach/Riss, Germany

Filed June 14, 1973, Ser. No. 369,971
Claims priority, application Germany, June 15, 1972, 2229318
Int. Cl. B66c *23/62*
U.S. Cl. 212—144 **8 Claims**

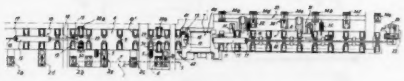


1. A rotary tower crane having a tower formed from a plurality of axially aligned tower sections each of said tower sections comprising:
a plurality of intersecting planar walls;
each of said planar walls of said tower section formed from at least one uniformly sized sidewall unit;
each of said sidewall units including a planar center section and two longitudinal edges;
connecting flange means on each of said longitudinal edges of said sidewall units, said connecting flange means detachably connecting adjacent sidewall units to form tower sections having cross sections of standard, closed, geometric forms;
each of said connecting flange means extending the length of said sidewall units and comprising:
first flange means connected to and intersecting said planar section of said sidewall means;
second flange means connected with said first flange means and intersecting said first flange means; and
said first flange means and said second flange means on adjacent sidewall units on adjacently intersecting walls of said tower sections coacting to form closed hollow sections.

3,866,761
DEVICE FOR PASSING TUBES THROUGH A HEAT TREATMENT INSTALLATION

Robert Della Rosa, Sedan, France, assignor to Vallourec Usines a Tubes de Lorraine-Escaut et Vallourec Reunies, Paris, France

Filed Mar. 16, 1973, Ser. No. 342,221
Claims priority, application France, Mar. 22, 1972, 72.10008
Int. Cl. C21d 9/14
U.S. Cl. 214—1 P **9 Claims**

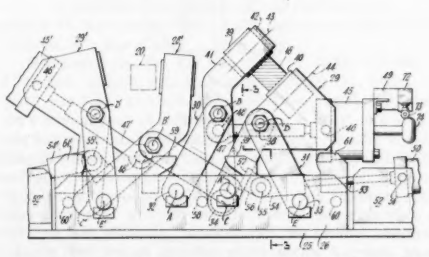


1. A device for passing tubes through a heat-treatment installation, comprising a heat-treatment installation, an input conveyor upstream of said heat-treatment installation having an assembly of pairs of rollers, an output conveyor downstream of said installation having an assembly of pairs of rollers, a carriage adapted to travel on the rollers of the conveyors and having two heads which are arranged at either end of said treatment installation and a beam which joins the two heads, a cap being provided on each head, mounted on a retractable arm and designed to fit just inside an end of the tube, and positive control means for displacing the carriage on the conveyor rollers in such a way that the caps can be introduced into the two ends of the tube to keep it round throughout the passage of the tube through said treatment installation on the carriage driven by said control means which, in addition, return the carriage to its starting position to receive another tube.

3,866,762
BILLET TWISTER

Hans Joachim Paletzki, Georgetown, S.C., assignor to Georgetown Steel Corp., Georgetown, S.C.

Filed July 24, 1973, Ser. No. 382,136
Int. Cl. B65g 7/00
U.S. Cl. 214—1 QG **26 Claims**

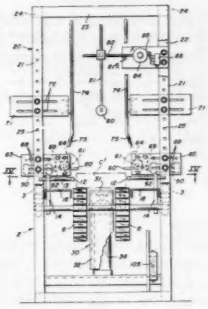


1. Mechanism for removably engaging and rotationally translating a workpiece having opposed sides, comprising a frame, two jaw members pivotally connected to each other and having opposed work-engaging means at corresponding locations offset from their pivotal connection, a first linkage member pivotally connecting a first point on said frame to one jaw member at a location intermediate the work-engaging and jaw-to-jaw pivot locations thereof, a second linkage member pivotally connecting a second point on said frame to the other jaw member at a location intermediate the work-engaging and jaw-to-jaw pivot locations thereof, said frame pivot locations being sufficiently spaced in excess of the spacing between link-to-jaw connections for a work-engaging condition of said jaw members that a limited arcuate displacement of said link members will effect a rotational displacement of work engaged by said work-engaging means, and frame-referenced actuating means connected to at least one of said members for imparting such limited arcuate displacement.

3,866,763
AUTOMATIC CASE STACKER

Frank P. Alduk, 116 Guadalcanal Rd., New Castle, Pa. 16105

Filed July 12, 1972, Ser. No. 270,948
Int. Cl. B65g 37/30
U.S. Cl. 214—6 BA **17 Claims**



1. Apparatus for arranging similar units into vertical stacks of predetermined height comprising:

a. a supporting frame with parallel sides and with a horizontally-extending conveyor means thereon comprising two parallel endless conveyors, one near each side of the frame with a space between them, the frame and conveyor having a receiving end onto which units to be stacked are placed in succession and a delivery end opposite the receiving end,

b. elevator means on the frame intermediate the two ends thereof and positioned in the space between the two endless conveyors, said elevator means having a platform which has a lower position over which units to be stacked are carried in succession by the conveyor means arranged to elevate each unit in turn to a selected uniform level above the conveyor means, with each succeeding unit after the first in a stack being raised underneath the one ahead until the stack comprises a predetermined number of units and is of a predetermined height, the elevator comprising also a fluid pressure-operated ram on which the platform is fixed and by which it is moved vertically,

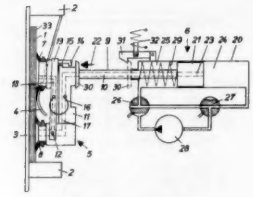
c. said frame having upwardly-extending frame members at each side thereof between which the elevator lifts the units to form a stack, the side frame members each having a unit-supporting dog thereon with the dog on one side being directly opposite the one on the other side, said dogs being movable in a vertical arc between a position where they are clear of the upward travel of the elevator platform but project under a unit raised above the level thereof by said platform to a position entirely clear of any contact with the units, there being horizontally-acting cylinder and piston units arranged to move and hold said dogs in position where they are entirely clear of any contact with the units and effecting their return to a position where they may extend under a unit that has been elevated by the platform,

d. fluid pressure-actuated means controlled by the height of the stack of units above said dogs for selectively holding said dogs out of unit-contacting position whereby the completed stack may then be lowered into said conveyor means to be carried thereby to the delivery end of the conveyor.

3,866,764
APPARATUS FOR THE SINGLE WITHDRAWAL OF ARTICLES IN SHEET FORM FROM A STACK

Hermann Leiser, Lohn, Switzerland, assignor to Strausak AG, Lohn, Switzerland

Filed June 6, 1972, Ser. No. 260,095
Claims priority, application Switzerland, June 11, 1971, 8493/71
Int. Cl. B65g *59/04*
U.S. Cl. 214—8.5 D **4 Claims**



1. An apparatus for the single withdrawal of articles of sheet from a stack, especially for picture postcard vending machines, having a suction device connected to a vacuum pump and movable to and fro in the direction of the stack and a drive device for the advance and retraction of the suction device, characterized in that:

the suction drive comprises two suction cups which are so arranged in relation to the stack that the first suction cup comes to act in the middle part and the second cup comes to act adjacent the edge of the article of sheet to be withdrawn, and in that

the drive device includes a longitudinally movable guided drive rod; and in that

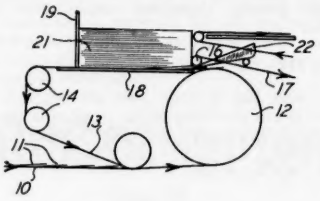
the suction device includes a cross-carrier connected to an end of the drive rod and extending transversely from the drive rod, a pivot arm pivotally connected to the cross-carrier and movable in a plane determined by the axes of the suction cups, stops limiting the pivoting range of the pivot arm, and a spring connected to the cross-carrier and the pivot arm for pressing the pivot arm toward the stack end of the pivoting range, the first suction cup being located on the pivot rod substantially in coaxial alignment with the drive rod, and the second suction cup being located adjacent the pivotal connection of the cross-carrier to the pivot arm, the axis of the second suction cup being parallel to the drive rod, whereby the drive device is operatively connected to the suction device to provide a limited amount of idle motion between the drive device and the first cup during the beginning of the retraction of the suction device in the withdrawal movement direction, so that the second suction cup is firstly retracted alone, thus lifting the edge of the article of sheet form away from the stack before its withdrawal.

3,866,765
SHEET STACKING AND PILE SEPARATING APPARATUS AND METHOD

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Oct. 11, 1973, Ser. No. 405,688
Int. Cl. B65g *59/06*
U.S. Cl. 214—8.5 SS **22 Claims**

1. A sheet stacker and pile separator apparatus comprising a conveyor for supporting sheets in a horizontal orientation and an imbricated relation and moving said sheets in a stream relation in the direction of the imbrication, a stop disposed at the downstream end of the stream in the path of movement of said sheets for stripping said sheets from their stream relation and causing them to form a stack of said sheets, a stack platform disposed adjacent said stop for receiving and supporting said stack, a combined separator and stack displacer member movably mounted directly above the stream and being movable along with said stream for movement of said member into

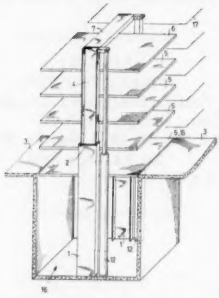


said stack in the direction of movement of the stream of sheets and thereby separating the end of said stack into an end pile of said sheets, and a powered member connected to said combined separator and stack displacer member for displacing said end pile from the remainder of said stack.

3,866,766
MULTI-LEVEL PARKING APPARATUS

Kaspar Klaus, 46 Schlachthofstrasse, 894 Memmingen, Germany

Filed July 28, 1972, Ser. No. 276,036
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 E **5 Claims**



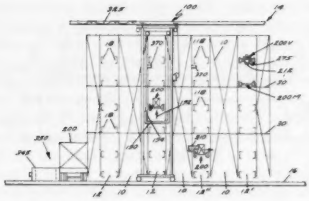
1. In a multi-level parking apparatus to accomodate a plurality of vehicles comprising a plurality of superimposed platforms connected together in a rigid structure, movable guide members disposed on said structure cooperating with fixed guide members, and means for raising and lowering said structure through the agency of said movable and fixed guide members, wherin the improvement comprises said structure being disposed within cavity-defining means with which a vehicle drive-on area is associated and wherein said guide members comprise a plurality of fixed upright guide elements associated with said cavity-defining means and a plurality of movable guide elements associated with said structure and engaging telescopically with said structure and engaging telescopically with said fixed guide elements so as to overlap them when said structure is in a raised position, said movable guide elements being adjustable in their height so that in a lowered position said structure is disposed substantially below the ground, said movable guide elements being disposed on opposite sides and near the central portion of the platform structure and extending beyond the uppermost platform, a cross member, said guide elements being interconnected by said cross member.

3,866,767

MOBILE TIER PICKING APPARATUS FOR A WAREHOUSING SYSTEM

Howard A. Zollinger, Ada Township, Kent County, and Le Roy Lubbers, Grand Rapids, both of Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Filed Feb. 15, 1973, Ser. No. 332,903
Int. Cl. B65g 1/06
U.S. Cl. 214—16.4 B 10 Claims



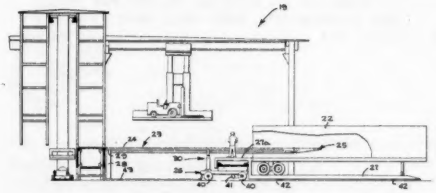
1. In a warehouse system comprising a mobile transfer vehicle, tiers of storage bin levels including access aisles with pairs of vertically spaced guide and support means extending along said aisles at each storage bin for carrying thereon in one said guide and support means of said pair, said mobile transfer vehicle which is adapted to travel within said aisles at a predetermined bin level, means on said mobile transfer vehicle for transferring unitized loads between a selected storage bin and said vehicle, said system including means movable across an end of said access aisles for transferring said mobile transfer vehicle between bin and aisle levels; the improvement comprising a mobile picking vehicle movable along the other one of said guide and support means of said pair at a predetermined bin and aisle level, said picking vehicle including picking means movably positioned thereon for picking an uppermost layer of articles of a unitized load removed from a storage bin and for transferring said layer of picked articles from said picking vehicle to a mobile transfer vehicle aligned with said picking vehicle at a selected storage bin level within an access aisle.

3,866,768

LOADING AND UNLOADING CONVEYOR

Stanley M. Weir, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 147,921, May 28, 1971, Pat. No. 3,715,043, which is a division of Ser. No. 20,711, March 18, 1970, Pat. No. 3,613,910. This application Aug. 1, 1972, Ser. No. 277,028
Int. Cl. B65g 67/02
U.S. Cl. 214—38 B 2 Claims



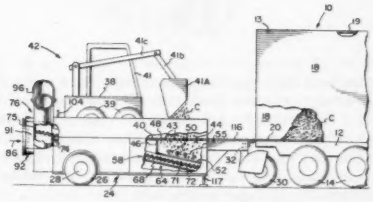
1. Apparatus for loading or unloading articles into or from a freight container comprising in combination, an elongated conveyor, means on said elongated conveyor for moving articles received thereon from one end thereof to the other, a ramp conveyor pivotally connected at one end to one end of said elongated conveyor and terminating at its opposite end in a wedge-like edge insertable under articles in the freight container, means on said ramp conveyor to move articles incrementally thereon from one end thereof to the other, said means including interdigitating stationary and movable fingers, said stationary fingers having a substantially planar lower surface, power operated means to raise and lower said one end of the elongated conveyor to bring the ramp conveyor to the approximate level of the floor of the freight container, and power operated means to pivot said ramp conveyor on the elongated conveyor to bring said ramp conveyor finger lower surface adjacent the level of the floor of the freight container to dispose said wedge-like edge for scooping articles from the container floor or depositing articles on the container floor.

3,866,769

WOOD CHIP HANDLING SYSTEM

Norval K. Morey, Weidman, and Leward N. Smith, Remus, both of Mich., assignors to Morbark Industries, Inc., Winn, Mich.

Filed Feb. 20, 1974, Ser. No. 443,957
Int. Cl. B65g 67/26
U.S. Cl. 214—44 A 5 Claims



1. Apparatus for unloading and piling particulate material, such as wood chips or the like from a load carrying vehicle having a load supporting floor, said apparatus comprising a material handling vehicle having frame means defining a material handling chamber, deck means on said frame means extending at a level above the chamber longitudinally fore and aft of said handling vehicle, means for vertically positioning the forward end of said deck means at the level of the floor of a load carrying vehicle, means defining an opening through said deck means through which material may be dropped into said chamber, said deck means including wheel support portions extending along the sides of said chamber forming elongate, fore and aft extending supports for the wheels of an auxiliary material carrying vehicle such as a front end loader to enable it to move back and forth lengthwise of said deck means across said opening to and from a rearward end limit in which said auxiliary vehicle is positioned to dump material through said opening into said chamber, blower means at the rearward end of said handling vehicle for blowing material from said chamber, and conveying means in said chamber for conveying material introduced into said chamber through said opening to said blower means.

3,866,770

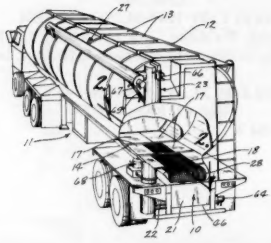
CONVEYING APPARATUS FOR A MATERIAL HANDLING VEHICLE

Harold S. Palmer, Oskaloosa, Iowa, assignor to Production Acres Mfg. Co., Oskaloosa, Iowa

Filed Mar. 8, 1974, Ser. No. 449,217
Int. Cl. B60p 1/38
U.S. Cl. 214—83.2 7 Claims

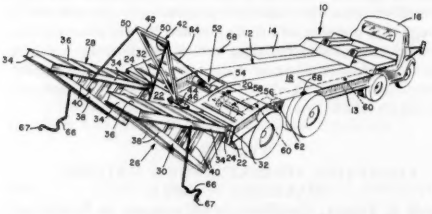
1. In a material handling system for a vehicle including a body unit having a longitudinal row of upright material containers having corresponding selectively operable bottom discharge outlets and a common discharge hopper for receiving material from said discharge outlets, a conveying apparatus for delivering material from said discharge outlets to said common discharge hopper comprising:

a. a longitudinally extended endless conveyor of a mesh construction having an upper run movable below and adjacent said outlets,
b. front and rear longitudinally spaced rollers for said endless conveyor, said upper run extended between said two rollers,
c. a drive roller for said endless conveyor located in said discharge hopper at a position downwardly and forwardly of said rear roller,
d. an idler roller located forwardly of said rear roller,
e. said endless conveyor having a portion which from said rear roller is trained about the lower portion of said drive



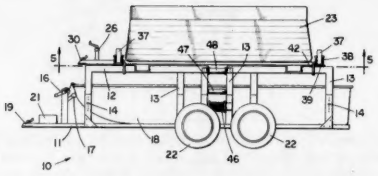
roller and the upper portion of said idler roller and a lower run extended from said idler roller to said front roller in a parallel relation with the upper run thereof,
f. a feed pan corresponding to said upper length extended substantially between said front and rear rollers having an upper surface in contact engagement with the bottom surface of said upper length, and
g. a return pan corresponding to the lower run of said endless conveyor having an upper surface in contact engagement with the bottom surface of said lower run, said return pan having an upright curved front section arranged in a concentric relation with the front half section of said front roller.

3,866,771
VEHICLE LOADING RAMP DISPLACEMENT APPARATUS
Lloyd W. Reid; Billy D. Rayle, both of Greensboro, and Harold C. Flinchum, Liberty, all of N.C., assignors to Reid's Trailer Inc., Pleasant Garden, N.C.
Filed Apr. 16, 1973, Ser. No. 351,543
Int. Cl. B65g *67/02*
U.S. Cl. 214—85 **5 Claims**



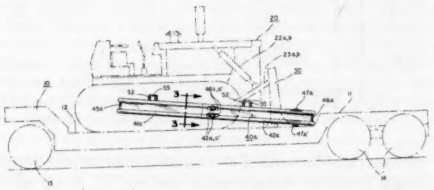
1. A vehicle having an elongated frame, a deck upon said frame defining a cargo supporting area, loading ramp means including a pair of spaced ramps at one end of said frame, means pivotably mounting said loading ramp means upon said frame for movement between a first, lowered position for facilitating loading and unloading of cargo, and a second, raised position during travel of the vehicle, a boom pivotably connected to said frame between said spaced ramps and flexible means interconnecting each of said spaced ramps to said boom, and power means including a winch recessed within said frame between said spaced ramps and having an elongated flexible member attached thereto and to the free end of said boom for pivoting said ramp means relative to said frame.

3,866,772
TWO DECK SPORT TRAILER
Dan J. Gardner, 2705 E. Washington St., Indianapolis, Ind. 46201
Filed Jan. 31, 1974, Ser. No. 438,434
Int. Cl. B60p *3/10*
U.S. Cl. 214—85.1 **3 Claims**



1. A trailer for transporting both a camper enclosure and a boat in stacked relation comprising, in combination, a wheeled trailer frame having an upper and a lower deck separated by upright frame members and a hitch at one end adapted for securing to a towing vehicle, an auxiliary frame of generally rectangular configuration adapted for attachment to the underside of a conventional camper enclosure, said auxiliary frame carrying wheels on the shorter pair of opposed sides of the auxiliary frame, said wheels having a pivotal connection to said auxiliary frame and thereby moveable between a supporting position in which they underlie and support the camper and a stowed position in which they are disposed in non-supporting position outboard of the camper, inclined ramp members detachably secured to said trailer frame adjacent said upper deck and spaced apart an amount corresponding to the space between the wheels on said auxiliary frame when in their supporting position for accommodation of said wheels, a winch on said wheeled trailer frame for drawing said auxiliary frame and attached camper up said ramp members and onto said upper deck, jacking means for temporarily lifting said auxiliary frame and camper to permit said wheels to be moved to their stowed position, means for fastening said camper to said upper deck, said lower deck of the trailer frame carrying longitudinal guide rails and further winch means for drawing a boat onto, and removing it from, said lower deck through the trailing end of said trailer frame, whereby said boat and camper can be loaded or unloaded on said trailer independently of each other.

3,866,773
METHOD OF FENDING COLLISIONS
Terry David Koch, Telford, Pa., assignor to Inno-Cept Corporation, Ambler, Pa.
Filed Oct. 16, 1972, Ser. No. 297,949
Int. Cl. B60p *3/06;* **B60r** *19/02;* **B61f** *19/04*
U.S. Cl. 214—152 **4 Claims**



1. Method for reducing the risk of injury to motorists from a collision with a large bulldozer in transit on an open-sided vehicle, said method consisting of separably attaching to said bulldozer a 'traffic protective device comprising a pair of

longitudinally-extended rigid guard members each of which is separably attached to said bulldozer in a position generally parallel and adjacent to the exterior side of a blade-lifting arm member of said bulldozer, and each of which is adapted in length and configuration, when attached in the aforesaid position, at one of its ends to partially shield at least a portion of the adjacent vertical edge of said blade member of said bulldozer and at its other end at least to partially shield the adjacent extremity of said blade-lifting arm member, thereby to deflect another vehicle colliding with said open-sided vehicle away from said vertical edge.

3. Method for transporting on an open-sided vehicle a bulldozer having a generally transverse blade member of a width sufficient to cause said blade member to extend beyond a side of said open-sided vehicle, so as to reduce the risk of injury to motorists from a collision with said bulldozer in transit, said method consisting of:

A. separably attaching to said bulldozer a traffic protective device comprising a pair of longitudinally-extended rigid guard members each of which is separably attached to said bulldozer in a position generally parallel and adjacent to the exterior side of a blade-lifting arm member of said bulldozer, and each of which is adapted in length and configuration, when attached in the aforesaid position, at one of its ends to partially shield at least a portion of the adjacent vertical edge of said blade member of said bulldozer and at its other end at least to partially shield the adjacent extremity of said blade-lifting arm member, thereby to deflect another vehicle colliding with said open-sided vehicle away from said vertical edge;

B. loading said bulldozer having said protective device on an open-sided vehicle with the longitudinal axis of said open-sided vehicle where said protective device is adjacent a side of said open-sided vehicle; and

C. transporting said bulldozer.

3,866,774

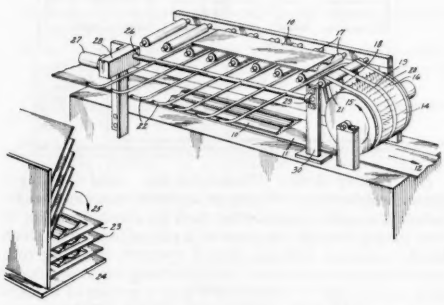
MECHANIZED THREAD BOOKING METHOD

Horst O. H. Ims, Waterloo, Ontario, Canada, assignor to Uniroyal, Ltd., Montreal, Quebec, Canada

Division of Ser. No. 299,493, Oct. 20, 1972,. This application Dec. 5, 1973, Ser. No. 421,907

Int. Cl. B65g *31/04*

U.S. Cl. 214—152 **3 Claims**



1. A method of booking tire teads in a tread truck having a plurality of vertically spaced leaves, comprising the steps of:

a. sequentially delivering a plurality of tire treads to a common station;

b. positioning said tread truck at a predetermined location adjacent to said common station;

c. moving said tire treads from said common station to said truck leaves along predetermined paths, each of which paths includes a portion thereof through which said treads are aerially projected to land on predetermined truck leaves.

3,866,775

FLUID SUPPORT AND DRIVE ARRANGEMENT FOR ROLLER TESTING DEVICES

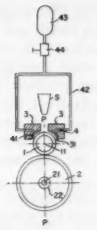
Rudolf Diem, Schweinfurt, Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Continuation of Ser. No. 109,808, Jan. 26, 1971, abandoned. This application May 4, 1973, Ser. No. 357,352

Claims priority, application Germany, Feb. 3, 1970, 2004628

Int. Cl. B65g *7/00*

U.S. Cl. 214—340 **8 Claims**



1. In an apparatus for testing and inspecting the surface of an elongated body of rotation, an arrangement for supporting and driving said body about its longitudinal axis comprising a driving wheel adapted to engage the surface of said body at a point on its surface, a plurality of supporting elements, at least one of said supporting elements being spaced about said body, in opposition to said driving wheel, at least one of said supporting elements being spaced from the axial end of said body and the remainder of said supports being spaced from the circumference of said body, means for conducting a pressurized medium through said supporting elements to the face of said body, said medium forming a cushion between the interfaces of said body and said supports maintaining said supports supports spaced from said body, said supports and said driving wheel being arranged to cause said medium to retain said body against said drive wheel and against sliding movement with respect to the drive means.

3,866,776

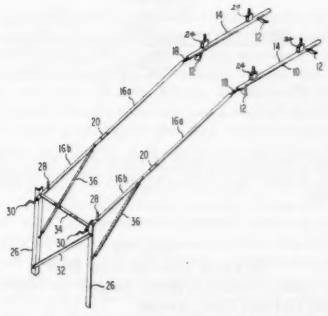
BOAT LOADER OF THE SIDE MOUNTING TYPE

Michael J. Partyka, 22 Jeremiah Ave., Trenton, N.J. 08610

Filed Oct. 25, 1973, Ser. No. 409,758

Int. Cl. B60p *3/10*

U.S. Cl. 214—450 **1 Claim**



1. A boat carrier mountable upon a motor vehicle and comprising:

1. a pair of parallel, generally horizontal cross members mountable on a vehicle roof and disposed to extend trans-

versely of said roof, at least one end of the cross members terminating adjacent one side of the vehicle;

2. means detachably connecting the respective cross members to the vehicle;

3. a pair of elongated, parallel rails pivotally joined at one end to said ends of the respective cross members and extending laterally downwardly from said side of the vehicle as continuations of the respective cross members;

4. a series of rollers disposable in supporting relation to the boat to be carried, and positioned to rollably support said boat upon the rails and cross members;

5. a pair of legs pivotally attached to the respective rails at the other ends thereof for swinging movement between a collapsed position in which said legs underlie and extend alongside the respective rails to an extent sufficient for disposition of said other ends of the rails at ground level, and a rail-supporting position in which the legs extend vertically downwardly from the rails, the legs in the collapsed position thereof supporting the rails in a position of greater inclination from the horizontal than is assumed by the rails when the legs are in their rail-supporting positions; and

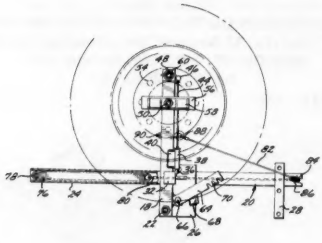
6. resiliently contractile means detachably connectable between said rails and the respective legs and tensioned to bias the legs from their rail-supporting to their collapsed positions whenever the legs are shifted vertically upwardly out of contact with the ground surface while in the rail-supporting positions thereof, said rails being pivotable upwardly from said positions of lesser inclination thereof to free the legs from contact with the ground surface, said legs being free to gravitate to their rail-supporting positions when the resiliently contractile means is disconnected and the rails are pivotally moved upwardly from said positions of lesser inclination thereof.

3,866,777

SPARE TIRE CARRIER

Steve Staranick, 2062 Mori Ln., Orange, Calif. 94087, and Jerome R. Garrison, 7931 Orangewood, Stanton, Calif. 90680

Filed Dec. 20, 1973, Ser. No. 426,876
Int. Cl. B62d *43/00*
U.S. Cl. 214—454 **5 Claims**



4. The invention defined in claim **3** in which said second member comprises a tube, said spring being disposed within said tube.

3,866,778

REFUSE COLLECTOR BODY

Manus Coffey, Dublin, Ireland, assignor to Murco Environmental Limited, Cork, Ireland

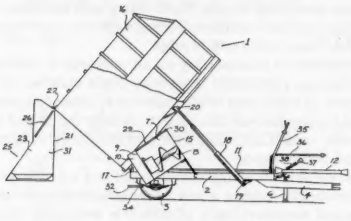
Filed June 1, 1973, Ser. No. 365,984
Claims priority, application Ireland, June 2, 1972, 755/72
Int. Cl. B60p *1/16*
U.S. Cl. 214—508 **8 Claims**

1. A refuse collector body comprising:

a base chassis;

a main container body, means pivotally mounting said main container body chassis;

a separate loading hopper, means mounting said loading hopper on the base chassis separate from said main container body, said loading hopper having an entrance for



the reception of refuse and an exit communicating with the interior of the main container body;

a feed screw mounted in the loading hopper;

means for pivoting the main container body relative to and over the loading hopper; and

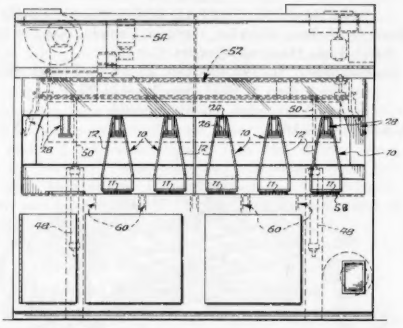
means for closing the entrance to the loading hopper.

3,866,779

AUTOMATIC PICK-UP DEVICE FOR HOLDING A CARRIER

Anthony A. Dongelmans, Hacienda Heights, Calif., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,578
Int. Cl. B65g *47/02*
U.S. Cl. 214—621 **3 Claims**



1. A pick-up device, adapted for raising and lowering a carrier, which carrier includes an upwardly extending handle including an upper portion offset from the gravitational line of force passing through the center of gravity of the carrier which handle comprises first and second upwardly extending rods each having first and second ends and being joined proximate their second ends by a third rod at least a portion of which is in a horizontal position and by a fourth rod spaced from and below the third rod at least a portion of which fourth rod is in a horizontal position, which pick-up device comprises:

a carrier arm including at least one slot for engaging the third rod of the carrier and at least one slot for engaging the fourth rod of the carrier said slots being defined by front and rear walls the front wall of each of said slots being the wall closest to the gravitational line of force passing through the center of gravity of the carrier, the front wall of the slot for contacting the third rod of the carrier having a vertically directed lower portion for engaging the third rod and an upper portion directed

upwardly and outwardly toward said gravitational line of force, which upper portion is adapted to guide the third rod into the vertically directed lower portion; and

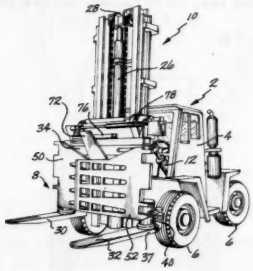
a horizontal bar secured to the carrier arm said horizontal bar being adapted to locate between the first and second rods of the handle and being substantially equal to the distance between the first and second rods of the handle at the vertical position of attachment of the horizontal bar when the third and fourth rods of the handle are engaged in the slots.

3,866,780

MATERIAL HANDLING ATTACHMENT FOR A FORKLIFT TRUCK

Richard Guy Miller, Federal Way; Ronald Adair Brudi, and Kenneth Lynley Brainard, both of Longview, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Sept. 4, 1973, Ser. No. 394,231
Int. Cl. B60g *47/00*
U.S. Cl. 214—655 **6 Claims**



1. A carriage assembly for an industrial load handling apparatus of the type adapted to be vertically movable on a frame, wherein the improvement comprises:

a carriage bulkhead having a front substantially vertical face,

a plurality of spaced apart fork arm members attached to said bulkhead toward the bottom thereof,

means to rotate said fork arm members from an extended working position to a retracted position generally behind said bulkhead,

a plurality of side arm members attached to said bulkhead generally at the sides thereof,

means to rotate said side arm members from an extended working position to a retracted position juxtaposed against said bulkhead,

a center support arm attached to said bulkhead and extending generally in a vertical plane,

means to rotate said center support arm from an extended working position to a retracted position juxtaposed against said bulkhead, and

said fork arm members, side arm members, and center support arm being rotatable independently of each other depending upon the type of load to be handled.

3,866,781

UNDERGROUND MINING MACHINE

Robert N. Stedman, Chillicothe; Jay J. Murphy, and Everette M. Volle, both of Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

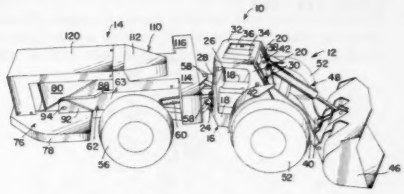
Filed Oct. 25, 1973, Ser. No. 409,623
Int. Cl. B66f *9/00*
U.S. Cl. 214—778 **12 Claims**

1. A material handling vehicle comprising:

a rear section having a pair of supporting wheels;

a front section having a pair of supporting wheels, the rear and front sections being connected together for pivotal movement about a vertical axis;

said front section comprising a unitary frame comprising a lower frame portion, an upwardly extending frame portion extending therefrom and comprising front leg means, and a roof portion at the upper portion of the upwardly extending frame portion;



a material handling implement adjacent the front of the front section; and

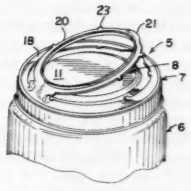
means on said front leg means and in front of said roof interconnecting the implement and the unitary frame of the front section for raising and lowering the implement relative thereto.

3,866,782

COMPOSITE CLOSURE

James E. Westfall, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,247
Int. Cl. B65d *41/46*
U.S. Cl. 215—253 **3 Claims**



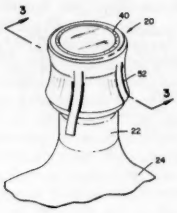
1. In a composite press-on, pull-off closure cap for hermetically sealing and maintaining a vacuum in a container whereby the closure and container in combination provide a package which is readily openable by a consumer without the use of tools, said composite closure having an integrally-formed, semi-rigid, plastic fitment with a top and a depending skirt and a relatively rigid, disc-shaped gasketed closure element retained within said fitment and having a continuous center panel terminating at the outer margin in a depending skirt or circumferential flange having a trimmed edge, said depending skirt of said fitment having interior shoulder means for lifting engagement with said trimmed edge, and said top of said fitment having an outer annular portion surrounding a lift ring joined to said annular portion by a hinge portion and a plurality of spaced frangible connections, the improvement which comprises, having the plastic material from which said fitment is formed thinned in a relatively small area adjacent at least one end of said hinge portion where it joins said annular portion whereby on lifting said lift ring after said frangible connections are broken, the thinned material in said small area is permanently stretched.

3,866,783

CLOSURE FOR WATER BOTTLE

Joseph John Bullock, Atherton, and Robert M. Greenhood, San Francisco, both of Calif., assignors to California Plastics Inc., San Francisco, Calif.

Filed May 29, 1973, Ser. No. 364,354
Int. Cl. B65d *41/48*
U.S. Cl. 215—254 9 Claims



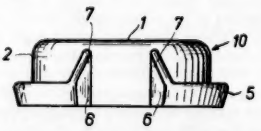
1. A cap for a container of the kind having a hollow neck, an annular finish at the end of the neck, an upper external first bead on the neck, a lower external second bead on the neck and a reduced diameter portion between the beads, said cap comprising, a generally flat circular top and a generally cylindrical skirt connected to and extending downwardly from the top, both the top and the skirt being formed from a plastic material as a unitary imperforate cap having sufficient flexibility to be pressed over the beads to a fluid sealing position, and wherein the skirt includes tension ring means for engaging an area of the skirt with an annular part of the lower surface of the first bead under a high unit pressure to provide a fluid seal and to retain the cap on the container neck and wherein the tension ring means include a substantially increased wall thickness in a ring extending circumferentially in the skirt and including a downwardly curved transition area between the top and the skirt and wherein said transition area is a reduced wall thickness section which elongates in length and effects an additional seal on the curved finish at the end of the neck and beginning of the first bead when the cap is pressed into sealing position on the container neck and wherein the top has a central disc shaped diaphragm for closing the hollow interior of the bottle neck and including expansion ring means between the diaphragm and the transition area for providing a hinge between the diaphragm and the transition area and skirt and for permitting the expansion required during said elongation of the curved transition area.

3,866,784

SINGLE-PIECE PLASTIC CLOSURE CAP

Reinhold Beck, Pfeffingen, Switzerland, assignor to Albert Obrist & Co. Dalplast-Produktion, Reinach, Switzerland

Filed Mar. 2, 1972, Ser. No. 231,291
Claims priority, application Switzerland, Mar. 16, 1971, 3790/71
Int. Cl. B65d *41/32*
U.S. Cl. 215—321 2 Claims



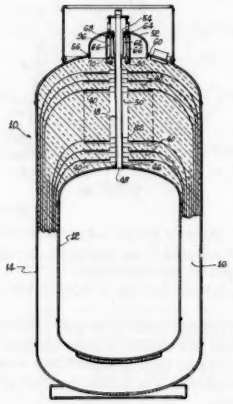
1. A closure cap formed of plastic for containers or the like, comprising a cap member having a substantially ring-shaped outer wall provided with an inwardly protruding annular bead at the central region of the axial length of said outer wall, a strap partially enclosing said ring-shaped outer wall of the cap member and disposed adjacent the free end of said outer wall, said strap extending along an arc which exceeds 180° and is less than 360° and having terminal regions which are bent toward the outer wall of the cap and connected with the outer wall of said cap member at spaced and neighboring positions, the end of the bent terminal regions of said strap forming an obtuse angle with the neighboring sections of said strap, the end of the bent terminal regions of the strap adjacent the top of the cap member being provided each with a wedge-shaped support wall connected with the outer wall of said cap member and extending toward the closed end of the cap member over said inwardly projecting bead, whereby said strap provides a point of leverage at the portion of said bead closest to the free end of said outer wall to facilitate removal of said cap from containers or the like.

3,866,785

LIQUEFIED GAS CONTAINER

Rolland R. Conte, Bourdonne/Conde, France, assignor to Beatrice Foods Co., Chicago, Ill.

Filed Dec. 11, 1972, Ser. No. 314,136
Int. Cl. F17c *13/00*
U.S. Cl. 220—9 D 4 Claims



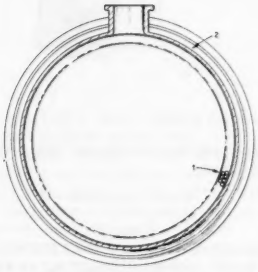
1. In a double walled liquefied gas container having an inner storage vessel with an opening at the top for access into the interior of the vessel, an outer shell substantially enclosing said inner shell with an insulation space in between, a neck tube connected at one end to the inner vessel about the opening and at the other end with an opening through the outer shell for the transmission of liquid and vapors therethrough into and out of the vessel, and a composite multi-layered insulation disposed about the inner vessel within said insulated space comprising multi-layers of low thermal insulating material alternating with one or more layers of reflective barrier sheets, the improvement comprising a plurality of rings of high heat conductive material secured in thermally contacting relation along longitudinally spaced apart portions of the neck tube and which extend outwardly from the neck tube for a short distance, disc members formed of thermally conductive material each having a central opening corresponding to the cross section dimension of the rings with one disc member secured at its inner edge portion to each of corresponding ones of said rings in thermally contacting relation, and heat conductive layers extending into the multi-layered insulation and overlapping at least a portion of each disc member for contacting relation therewith, in which the rings are formed with an annular skirt portion depending from the peripheral edge portion of the rings and in which the disc members are formed with an annular skirt portion extending substantially perpendicularly from the inner periphery thereof and means

joining the skirt portions of said rings said disc members in telescoping relation one with the other.

3,866,786
ENERGY ABSORBING STRUCTURE IN A STEAM GENERATOR

Adrian B. Van Weelderen, Pensacola, Fla., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 22, 1972, Ser. No. 291,477
Int. Cl. B65d *3/22, 25/14*
U.S. Cl. 220—10 **4 Claims**



1. Apparatus for absorbing energy comprising:
a. two concentric thin-walled cylinders,
b. a plurality of thin-walled tubes disposed in the zone between said cylinders in an abutting relationship with each other and with said cylinders, said tubes extending along the entire length of said cylinders and being tightly filled with compacted steel wool.

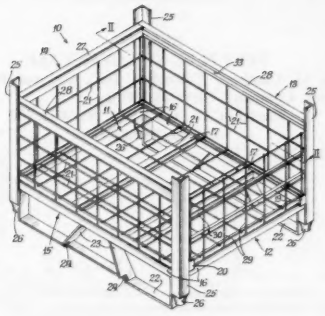
4. The apparatus of claim **3** wherein the outer cylinder has an outside diameter in the range of from 34 to 40 inches, and an inside diameter in the range of from 33½ to 39½ inches, and the inner cylinder has an outside diameter in the range of from 32½ to 38½ inches and an inside diameter in the range of from 32 to 38 inches.

3,866,787
MATERIAL HANDLING CONTAINER WITH OPENABLE SIDEWALL

Theodore H. Allegri, Peoria; John M. Womble, Morton, and Norman Cannon, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 4, 1972, Ser. No. 311,825
Int. Cl. B65d *21/00, 7/20*
U.S. Cl. 220—19 **8 Claims**

1. An open top container comprising a horizontally disposed bottom wall,
three vertically disposed sidewalls each extending vertically substantially the full height and width of said container and connected together and to said bottom wall to define a storage compartment in said container, each of said bottom and sidewalls comprising a rigid rectangular frame including a plurality of vertically and horizontally disposed bars,
a fourth vertically disposed sidewall comprising a rigid rectangular frame including a plurality of vertically and horizontally disposed bars extending substantially the full height of said container but having a width slightly less than the width of said container,
continuous guide means, comprising first parallel guide portions disposed interiorly on a pair of said vertically disposed bars at said one sidewall and second parallel guide portions disposed interiorly on a pair of said horizontally disposed bars at the top of said container,
slide means secured to opposite sides of said fourth sidewall, a given distance below the top thereof and engaging said guide means to permit movement thereof from its normal, vertically disposed closed position to a horizontally disposed open position at the top of said container and
upstanding guide means rigidly mounted on the exterior of the edge of said bottom wall which corresponds to the bottom edge of said fourth sidewall when in its normal vertically disposed closed position, said upstanding guide means having a vertical height less than said given distance of said slide means below the top of said fourth

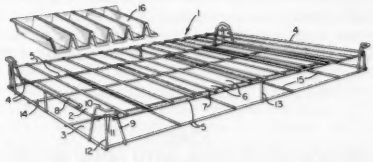


sidewall whereby said bottom edge of said fourth sidewall is received behind said upstanding guide means when said fourth wall is in its normal vertically disposed closed position to rigidly restrain said fourth sidewall against horizontal forces exerted outwardly thereon from the interior of said container, and whereby said fourth sidewall may be raised vertically said given distance to disengage said bottom edge thereof from said upstanding guide means before it is pivoted to said horizontally disposed open position thereof at the top of said container by the engagement between said slide means thereon and said continuous guide means.

3,866,788
WIRE CRATE

Jacobus Cornelis Smit, Venhuizen, Netherlands, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Filed Feb. 28, 1973, Ser. No. 336,461
Claims priority, application Belgium, Apr. 10, 1972, 781867
Int. Cl. B65d *7/20, 21/00*
U.S. Cl. 220—19 **3 Claims**



1. A wire crate for plant strips and the like comprising:
a. substantially parallel upper and base surfaces,
b. each of said surfaces being formed by spaced parallel end and side wire members,
c. said upper surface being evenly divided into a plurality of rectangles by means of regularly spaced cross-wires parallel to one of said members and positioned so that the distance between said cross-wires is substantially equal to the width of the upper surface of the plant strips to be placed in said rectangles,

d. said upper surface including a distance keeper parallel to said one of said members and said cross wires and positioned between said one of said members and the cross wire nearest thereto so that the distance between said one of said members and said distance keeper is substantially one half of the width of said rectangles,

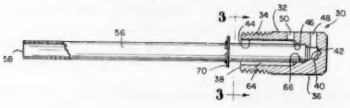
e. whereby when one of said crates is rotated 180° with respect to another of said crates and stacked on said other of said crates, none of the rectangles in said one of said crates will be directly above the rectangles in said other of said crates.

3,866,789

VENT PLUG FOR GEAR CASE

George M. Lambert, Columbus, Ind., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Jan. 16, 1974, Ser. No. 433,730
Int. Cl. B65d *51/16*
U.S. Cl. 220—44 R **7 Claims**



1. A vent plug for use with a gear case containing lubrication oil and rotating transmission elements and having an opening in its wall, said plug comprising a fitting adapted to engage and close said opening, said fitting having an engaging body portion proportioned and designed to be disposed in the wall opening and an outer body portion proportioned and designed to extend outwardly from the wall, said fitting being provided with an axially extending bore entering the inner end of said engaging body portion and terminating with a closed end in said outer body portion, said bore having an outer section of a first diameter and an inner section of a second and greater diameter, said inner section of said bore terminating in said outer body portion, said fitting also having, in said outer body portion, a transaxially extending opening venting the outer section of said bore and a second transaxially extending opening venting the inner section of said bore, and a tube concentrically and axially disposed in said bore and extending axially into the interior of the case to provide communication between the outer bore section and said interior, said tube having an outer diameter less than the said second diameter to provide an annular passageway communicating between said inner bore section and the interior of the case.

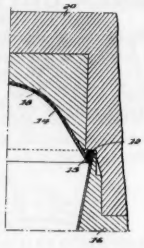
3,866,790

CONICAL CONTAINER WITH DOME-SHAPE LID

Thomas E. Marion, Baltimore, and Richard D. Collins, Timonium, both of Md., assignors to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 269,304, July 6, 1972, Pat. No. 3,779,191.
This application Aug. 24, 1973, Ser. No. 391,326
Int. Cl. B65d *51/00*
U.S. Cl. 220—67 **2 Claims**

1. A package comprising a conical container having an outwardly curled rim around an open end thereof in combination with a dome-shaped closure means having an annular flange, said dome shaped closure means being secured in said open end of said conical container by crimping said curled rim and annular flange together, said curled rim being constrained



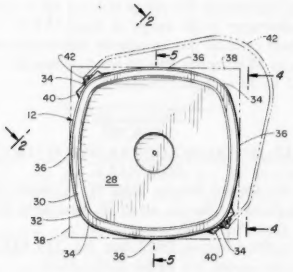
inboard of said container and crushed into juxtaposition with said annular flange.

3,866,791

CONTAINER AND COVER INCLUDING CORNER POURING AND BAIL NESTING FEATURES

William H. Roper, Los Angeles; Robert E. Roper, Los Alamitos, and Charles R. Roper, Huntington Beach, all of Calif., assignors to Frank Roper, North Hollywood and Ralph A. Miller, Van Nuys, both of Calif., part interest to each

Filed May 17, 1972, Ser. No. 254,042
Int. Cl. B65d *25/28*
U.S. Cl. 220—95 **16 Claims**



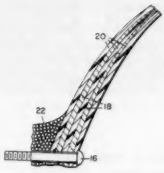
1. In a container of the type having upstanding side walls terminating upwardly defining a container top extremity somewhat rectangular in top plan view; the improvements comprising: said container top extremity in top plan view curving continuously arcuately outwardly oppositely from joining corners to maximum outward projection at side central portions; bail attachments on said container aligned with diagonally opposite of said top extremity joining corners and projecting outwardly of said top extremity joining corners; said container top extremity in top plan view defining an area greater than the area of an imaginary circle of maximum radius totally within said container top extremity area; and said bail attachments approaching while being totally within corner portions of an imaginary rectangle of maximum size formed about said container top extremity in top plan view touching said container top extremity maximum outward projections.

3,866,792

INTEGRAL FILAMENT REINFORCED COMPOSITE-ROCKET CHAMBER/ADAPTER

Charles M. Minke, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 2, 1973, Ser. No. 337,351
Int. Cl. B65d 7/42; F02k 9/00
U.S. Cl. 220—72 2 Claims



1. A lightweight, high pressure, integral filament reinforced composite chamber/adapter comprising:

a. a filament wound chamber having an interior cavity, an exterior surface, and at least one polar opening extending from the interior cavity to the exterior surface of said chamber, said chamber comprising helical windings of glass filament, and

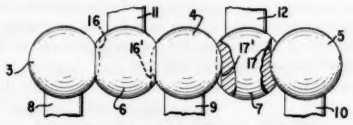
b. a filament reinforced composite adapter integral with said chamber, said adapter comprising a plurality of mats interspaced between the helical windings of glass, said mats comprising a plurality of spirally hoop wound high modulus filaments faced with glass fiber tapes extending radially outwardly from said polar opening, said filaments having a modulus of elasticity of at least 20×10^6 pounds per square inch, said spirally hoop wound filaments extending outwardly from said polar opening, said glass filament windings and said mats providing a dimensionally stable adapter surface for attachment of chamber accessories.

3,866,793

HINGED BOX

Robert J. Mulligan, Wheaton, Ill., assignor to Richardson-Merrell Inc., New York, N.Y.

Filed Oct. 27, 1970, Ser. No. 84,429
Int. Cl. B65d 51/04
U.S. Cl. 220—31 S 2 Claims



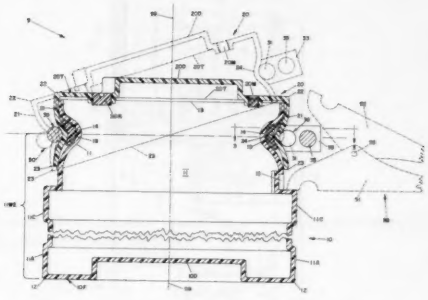
1. A hinged box having a body section and a cover section with two hinge members each comprising 5 ball-like elements which terminate on studs extending outwardly from the back sections of the box, the center line of said five ball elements being on a line parallel to the back of the box and in a plane formed by the inner edges of the body section and cover section of the box, two pairs of said ball elements of each hinge member protruding from one section of said box, and three ball elements of each hinge member protruding from the other section of said box, each ball of the two ball element members having two grooves extending only part way across the chord of the ball, the bottommost section of each groove extends halfway across each ball element, the two innermost grooves of each of said two ball elements being parallel and running in the same direction, the grooves on each of the outer-most faces of the said two ball elements being parallel to each other but starting across the ball elements from a different direction than do the grooves on the other side of the balls.

3,866,794

READILY RE-CLOSEABLE AND RE-USABLE CONTAINER OF THE LID AND OPENHEAD DRUM TYPE

Raymond W. Kerr, 3731 N. 58th St., Lincoln, Nebr. 68529

Continuation of Ser. No. 279,461, Aug. 10, 1972, now abandoned. This application Jan. 21, 1974, Ser. No. 434,961
Int. Cl. B65d 45/32, 41/00, 51/18
U.S. Cl. 220—320 6 Claims



1. A readily re-closeable and re-useable container of the lid and open-head drum type for storing solids, liquids, and other bulk materials therein in readily withdrawable condition, said container comprising:

A. A stably uprightable open-head drum comprising an open-top tubular housing surrounding a vertical-axis and extending upwardly from an annularly connected floor-panel that transversely intersects said vertical-axis whereby the floor-panel and tubular housing together provide an open-head type drum receptacle, the external side of said drum tubular housing nearer the annular upper open-end than to the floor-panel being provided with a cross-sectionally narrowed waist that completely surrounds said vertical-axis, the drum below the narrowed waist being provided with an externally accessible notched portion adapted to provide a bearing point for one leg of a reverse-scissors type bearing tool;

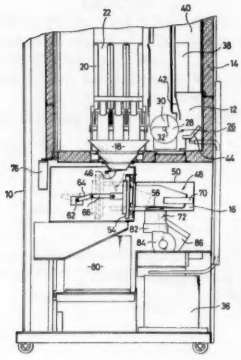
B. A removably engaged lid closure for the open-head drum annular upper open-end, said lid closure including a transversely extending roof-panel together with a depending skirt annularly connected to the roof-panel, said depending skirt including an annular lower open-end and also including thereabove an inwardly extending annular rib located within and frictionally engaged with the drum narrowed waist, said depending skirt being additionally provided with an externally grooved portion at co-elevation with said inwardly extending annular rib and

C. A tightenably constrictable horizontal girth band located within the externally grooved portion of the lid skirt, said girth band surrounding the drum vertical-axis and being provided with a horizontal bolt tightener means located spatially radially outwardly offset from said girth band, said frictionally engaged housing and lid skirt being resiliently spreadable away from each other with a said leverage tool engaged within two bearing points comprising said drum notched portion and the tightenable girth band bolt means whereby the lid skirt inward annular rib can pass vertically between the housing narrowed waist and the upper open-end thereof to permit opening of said container.

3,866,795
VENDING MACHINE HAVING HEATING AND COOLING CHAMBERS

Hitomi Urano, Tokyo, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Aichi Prefecture, Japan

Filed Nov. 10, 1972, Ser. No. 305,477
Claims priority, application Japan, July 1, 1972, 47-66264
Int. Cl. B65g *59/06*
U.S. Cl. 221—150 HC 3 Claims



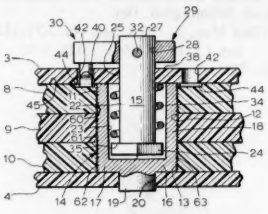
1. A vending machine comprising a cold storage chamber, a heating chamber contiguous to said cold storage chamber and being heat insulatingly separated therefrom, said cold storage chamber being provided with food compartment means for accommodating food products therein, feed cam means in said cold storage chamber and mounted in operative relation to said compartment means for permitting discharge of at least one food product under control of a customer applied coin, and conduit means extending between said feed cam means in the cold storage chamber and said heating chamber for supply to the latter of the food product discharged from said compartment means, said heating chamber including an electronic heating means including a fixed casing and a movable container disposed in relation to said conduit means to receive the food product discharged from said compartment means for movement with the container into the fixed casing for heating therein, said container being adapted for removal from said casing after said heating of said product and for automatic discharge of the product from the container as a function of container removal from said casing.

3,866,796
CHILDPROOF PILL DISPENSER

John S. Bozek, Chicago, Ill., assignor to Continental Can Company, New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,540
Int. Cl. G07f *11/16*; B65d *83/04*
U.S. Cl. 221—152 11 Claims

1. In a childproof closure for a container having a wall structure with a discharge opening therein, manually operable metering means having a predetermined course of movement for metering the contents from said container through said opening, manually positionable latch means disposable in noninhibiting position to said movement of said metering means, and means for releasably interlocking said latch means with said metering means for shifting said latch means for said non-inhibiting position to an interlocking position with said

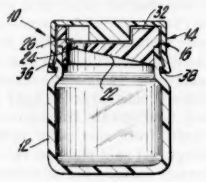


metering means upon a predetermined manipulated movement of said metering means.

3,866,797
CONTAINER CAP WITH TRAP DISPENSING MEANS

Manuel W. Palomo, 2530 Thorn Dr., Mississauga, Ontario, Canada

Filed Feb. 21, 1973, Ser. No. 334,304
Int. Cl. B65d *83/04*
U.S. Cl. 221—263 1 Claim



1. A container cap comprising a lower partitioning member adapted to plug the mouth of a container and be held in fixed position with respect therewith; an upper capping member mounted over the plug having a chamber formed in its underside; said capping member being movable around the container mouth; a discharge opening formed in the capping member; a discharge passage formed in the lower partitioning member; the chamber and passage being unobstructedly alignable upon the movement of the capping member; the chamber and the opening being alignable upon further movement of the capping member; said capping member being spring biased with the spring obstructing the discharge passage in the rest position of the capping member.

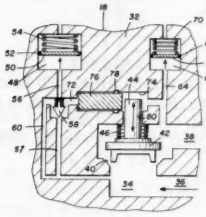
3,866,798
LEAK DETECTION APPARATUS

Barry T. Marsh, Bridgeport, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 213,029, Dec. 28, 1971, Pat. No. 3,788,127. This application Aug. 17, 1973, Ser. No. 389,410
Int. Cl. B67d *5/34*
U.S. Cl. 222—52 2 Claims

1. An improved fuel dispensing system comprising:
a fuel reservoir;
pump means disposed in communication with said reservoir for pumping fuel out of said reservoir;
a fuel dispenser located remote from said reservoir and including fuel delivery means and a valve for controlling the flow of fuel to said fuel delivery means;
conduit means connecting said pump means and delivery means in fluid communication; and
leak detection means operably connected in said conduit means remote from said fuel dispenser, said leak detection means having a fuel flow passageway extending

therethrough, an annular valve seat encircling said passageway, a valve member moveable toward and away from said valve seat, means biasing said valve member toward said seat for closing said passageway, timing accumulator means in communication with said passageway between said valve member and pump means, said timing accumulator means including a chamber, pressure responsive means in said chamber, and means for controlling the rate of flow from said chamber whereby said chamber will empty in a predetermined time after said valve is closed, leak-rate accumulator means in communication with said passageway between said valve member and said valve, said leak-rate accumulator means including a chamber, pressure responsive means in said chamber, and means for controlling the rate of flow from said chamber to the conduit between said valve member and valve, passage means connecting said timing and leak-rate accumulator means, and a piston sealingly disposed in said passage means and moveable therein between a first position when pressure in said leak-rate accumulator means is greater and a second position for engaging said valve member to limit movement of said valve member away from said valve seat, when pressure in said timing accumulator means is greater thereby indicating a leak by reducing the fuel flow rate when fuel is subsequently dispensed from said fuel dispenser.



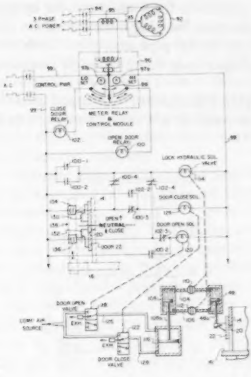
3,866,799

MIXER WITH AUTOMATICALLY CONTROLLED DISCHARGE SYSTEM

Leslie D. Rikker, Oak Forest, and Gerhard A. Suckfuell, Mount Prospect, both of Ill., assignors to National Engineering Company, Chicago, Ill.

Filed June 18, 1973, Ser. No. 370,794
Int. Cl. B67d *5/08*
U.S. Cl. 222—63 **5 Claims**

1. A mixer for conditioning bulk material comprising in combination; a mixing chamber and motor means driving a rotary mixing element in said chamber; and a controllable discharge system for discharging material from said chamber at a selected rate, said discharge system comprising an outlet opening formed in said mixing chamber, a discharge door adjacent said opening mounted for reciprocal vertical movement between a closed position covering said opening and an open position uncovering said opening, and means for normally maintaining said door in a fixed neutral position partially uncovering said opening and operable to move the door out of said neutral position when a selected variation in load on said motor means is exceeded and to return said door to said neutral position when said variation is no longer exceeded, said maintaining means including a fluid motor connected to said door and means for entrapping noncompressible liquid in said motor to retain said door in said neutral position, said entrapping means including liquid valve means operable to release entrapped liquid whenever said selected variation in load is exceeded.



3,866,800

NON-PRESSURIZED PACKAGE CONTAINING SELF-HEATING PRODUCTS

William H. Schmitt, Elmhurst, Ill., assignor to Alberto Culver Company, Melrose Park, Ill.

Filed Feb. 12, 1969, Ser. No. 798,628
Int. Cl. B65d *35/24*
U.S. Cl. 222—94 **12 Claims**

1. A non-pressurized packaged product comprising two separate compositions which are adapted to be mixed together to form a final heated composition which is dispensed from said package, said package having two separate compartments for separate storage of said two compositions, one of said compartments containing a composition comprising an oxidant in an aqueous medium, and the other of said compartments containing a substantially anhydrous composition which includes a reductant, a water-soluble organic solvent, a compressible gas which is substantially water-insoluble but which is soluble in said organic solvent, said compressible gas existing as a gas at a temperature in the range of ambient temperature to about 70°C. and existing as a liquid at said temperature under superatmospheric pressure, the aforesaid two separate compositions, when admixed, resulting in the release of said compressible gas by reason of the insolubility of said gas in the solution of said organic solvent and said water.

3,866,801

DISPENSER WITH METERING TUBE HAVING OUTLET VALVE

Johnny R. Stapleton, 907 Ayers St., Coffeyville, Kans. 67337

Filed Aug. 28, 1973, Ser. No. 392,326
Int. Cl. B67d *5/62*
U.S. Cl. 222—146 C **2 Claims**

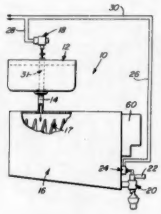
1. Dispensing apparatus, comprising, in combination:

a. a hopper having a bottom provided with an outlet, and an outlet pipe affixed to the bottom of the hopper and arranged extending from the hopper, the outlet pipe being arranged surrounding the outlet;

b. a measuring tube housing in the form of a longitudinally extending tube provided with a pair of spaced, open ends, one of which open ends is provided with a restriction forming a valve seat and an enlarged portion arranged

adjacent the one of the open ends and partially forming a wall of the tube, and an opening provided in the enlarged portion substantially at a right angle with respect to the one of the open ends, the enlarged portion spaced from one of the open ends a distance permitting the enlarged portion to form an abutment engaging a bottom of the hopper and limiting insertion of the one of the open ends into the outlet pipe associated with the hopper, the one of the open ends being sealingly inserted into the pipe outlet;

c. a valve element movably arranged in the housing for selective movement toward and away from the one of the



open ends and between sealing engagement with the fluid passing disengagement from the restriction forming the valve seat; and

d. a spigot arranged for controlling flow from a freezing chamber associated with the hopper outlet pipe, and a solenoid connected to the valve element and to the spigot for being actuated by a flow permitting position of the spigot and unblocking the one of the open ends and maintaining a constant amount of a material passing from the hopper to a freezing chamber while preventing air from escaping from the freezing chamber to the hopper during blending of the material in the freezing chamber.

3,866,802

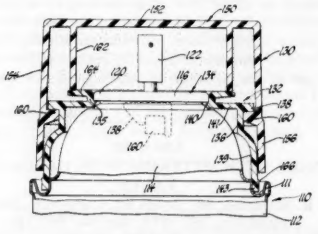
CHILD PROOF CLOSURE ASSEMBLY

Stewart Hector Birrell, Mississauga, Ontario, Canada, assignor to Reflex Corporation of Canada Limited, Windsor, Ontario, Canada

Continuation-in-part of Ser. No. 158,823, July 1, 1971, abandoned. This application May 5, 1972, Ser. No. 250,720

Int. Cl. B67d *5/32*

U.S. Cl. 222—153 **32 Claims**



1. A child proof closure assembly comprising: an adapter having a central opening and a mounting portion adapted to be secured to an aerosol container or the like, a container locking portion extending axially with respect to said central opening, a plurality of container locking elements spaced from each other on said container locking portion, and container mounting means for securing said adapter to a container; a cap having an end wall, a peripheral skirt projecting from said end wall for receiving said container locking portion, and a plurality of cap locking elements spaced peripherally from each other on the inner surface of said skirt; said cap locking elements being engageable with and disengageable from said container locking elements by an axial motion followed successively by a rotative motion of said cap relative to said adapter; and biasing means engageable between said cap and adapter for biasing said cap locking elements toward locked engagement with said container locking elements, said biasing means including radially projecting spring means integrally formed on one of said cap and adapter and plunger means integrally formed on the other of said cap and adapter, said plunger means being engaged with said spring means with the cap and container locking elements are in locked engagement with each other such that the cap and container locking elements are biased against movement from locked engagement with each other by the engagement of said plunger means with said spring means; said cap and container locking elements being axially disengageable by axial movement of said cap toward said adapter to cause said plunger means to deflect said spring means.

3,866,803

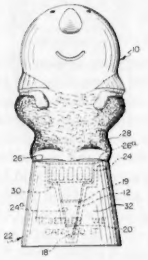
DECORATIVE FIGURINE AND DISPENSER

Max H. Kipfmueller, Berea, Ohio, assignor to American Greetings Corporation, Cleveland, Ohio

Filed Sept. 20, 1973, Ser. No. 399,189

Int. Cl. B65d *37/00*

U.S. Cl. 222—179.5 **11 Claims**



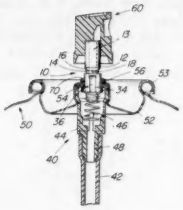
1. In combination a flexible free-standing decorative figurine and dispenser comprising, a collapsible hollow stylized member providing a squeeze container, a dispensing nozzle projecting from the underside thereof for discharging the contents of said container member upon squeezing of the latter, a base member for supporting said container member in nozzle-down position, said base member having a recess formed therein adapted to receive said nozzle in the supported condition of said container member on said base member, whereby the stylization of the container member is visible in said nozzle-down position on said base member, said nozzle having means on the exterior thereof adapted for sealing coaction with the defining side surface of said recess in said base member for preventing egress of odors and solidifying of the contents of said container member in the inverted nozzle-down supported condition of said container member on said base member, said means on said nozzle comprising at least one circumferential-like embossment projecting generally laterally outwardly, said container member on its underside engaging an upper surface of said base member, said nozzle being generally spaced from the confronting defining side surface of said recess except where said embossment engages said defining side surface in snug sealing relation, said engagement of said embossment with said defining side surface occurring below the supported engagement of said container member on said upper surface of said base member.

3,866,804

AEROSOL VALVE WITH PRESSURE RELIEF VENT

Silvester William Stevens, Macquarie Fields, New South Wales, Australia, assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,408
Claims priority, application Australia, Mar. 7, 1973, 52991/73
Int. Cl. B65d 83/14
U.S. Cl. 222—396 4 Claims



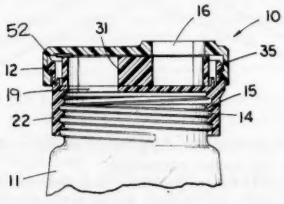
1. In a valve for a pressurized aerosol dispenser comprising a product container having an apertured end closure including means for supporting the valve; the valve comprising:
a valve housing;
a movable valve member in said housing and having a body portion including a shoulder normally interior of the dispenser, a product outlet passage for conveying product through the end closure aperture and a transverse valve orifice in communication with the outlet passage;
a resilient annular gasket blocking the transverse orifice and overlying said shoulder; and means to bias the movable member toward closure of the valve;
the excessive internal pressure relief improvement which comprises a size relationship between the movable member body portion and the end closure aperture which will allow the body portion and shoulder to distort the annular gasket and be forced partially through the annular gasket and end closure aperture against the resistance provided by the gasket and the end closure aperture by excessive internal pressure and a duct formed in the exterior surface of the body portion, the uppermost portion of the duct extending through the end closure past the distorted gasket to vent excessive internal pressure only when the body portion has been forced through the aperture.

3,866,805

DISPENSING APPARATUS WITH A TRAP CHAMBER PULVERULENT

Earl F. Hamilton, Jr., 636 Rayham Ct., Indianapolis, Ind. 46234

Filed Oct. 5, 1973, Ser. No. 403,807
Int. Cl. G01f 11/46
U.S. Cl. 222—427 5 Claims



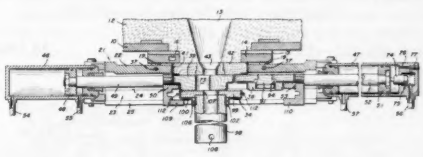
1. An apparatus for dispensing pulverulent material from a container with said container having a first outlet opening downwardly comprising:
a ring having a top end and a bottom end with said top end adapted to be mounted to said first outlet, said ring including a lid wall mounted between said top end and said bottom end and adapted to extend across and cover said first outlet with said lid wall having a second opening to allow passage of pulverulent material;
a cap with a third opening, said cap being rotatably mounted to said bottom end of said ring, said cap having means engageable with said ring operable to limit rotational movement of said cap from a rotor engaging position to a dumping position and back to said rotor engaging position and further operable to limit rotational movement of said cap to prevent said third opening from overlapping said second opening;
a one-way rotatable rotor mounted to said bottom end of said ring between said lid wall and said cap with said rotor being rotatable about an axis in a given direction, said rotor including a plurality of radially extending vanes forming a plurality of pulverulent material storage spaces with one each of said spaces being located between two each of said vanes, said vanes being positioned to simultaneously align one of said spaces with said second opening and another of said spaces with said third opening when said cap is in said rotor engaging position, said rotor including a plurality of leaf spring receiving recesses with one each of said recesses being provided for one each of said storage spaces; and,
a leaf spring having a proximal end mounted to said cap between said cap and said rotor, said spring having a distal end with said spring extending from said proximal end to said distal end in said given direction, said distal end being spring biased into one of said recesses to force said rotor to rotate with said cap as said cap is rotated from said rotor engaging position to said dumping position, said distal end being yieldable to disengage said rotor and allow said rotor to be stationary as said cap is rotated to said rotor engaging position.

3,866,806

OPERATING MECHANISM FOR SLIDABLE GATES AND METHOD OF OPERATING SLIDE GATE

Earl P. Shapland, Jr., Champaign, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

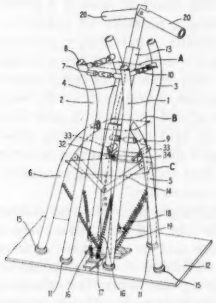
Filed Mar. 1, 1973, Ser. No. 337,252
Int. Cl. B22d 37/00
U.S. Cl. 222—504 16 Claims



1. An operating mechanism for slidable gates which are used to control flow of liquid from a bottom-pour vessel, said mechanism comprising a frame for attachment to the bottom of the vessel, gate-supporting means on said frame for slidably supporting blank and orifice gates for movement between a ready position, a slow-motion region under the vessel outlet, and a removal position beyond said slow-motion region, the slow-motion region of an orifice gate extending at least from a position of the gate in which the vessel outlet is partially open to a position in which it is fully open, and main and auxiliary drive means carried by said frame at opposite ends of the path of gate movement, said main drive means being adapted to push a gate from said ready position into said slow-motion region and to displace a gate already in said slow-motion region into said removal position, said auxiliary drive means including means for retarding the rate of movement of gates as they reach said slow-motion region, which

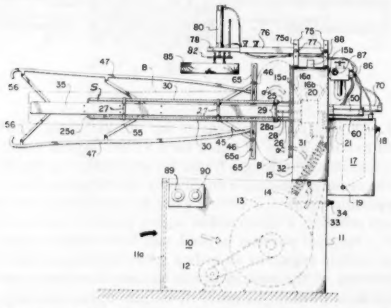
last-named means permits an orifice gate to move rapidly from said ready position to said slow-motion region and thereafter slowly and under close control in either direction to any teeming position within said slow-motion region.

3,866,807
FORMER FOR MOULDING GARMENTS
William Geoffrey Parr, Pontypool, England
Filed Mar. 8, 1974, Ser. No. 449,558
Claims priority, application Great Britain, Mar. 20, 1973, 13301/73
Int. Cl. A41h *5/00*
U.S. Cl. 223—68 **7 Claims**



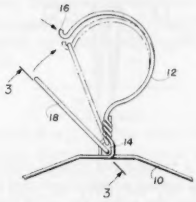
1. A former for moulding a fabric garment shape having chest, hip and waist planes corresponding to a person's body, said former comprising a number of members interconnected and arranged about an imaginary common axis such that at least four of said members define a quadrilateral at the chest plane, at least six of said members define a hexagon at the hip plane, and at least four members define a geometrical figure selected from the group consisting of a quadrilateral, pentagon and hexagon at the waist plane.

3,866,808
PANTS PRESSER
Stanley M. Bailey, 342 Washington St., Hamburg, Pa. 19526
Filed May 14, 1974, Ser. No. 469,829
Int. Cl. D06c *15/00*
U.S. Cl. 223—73 **20 Claims**



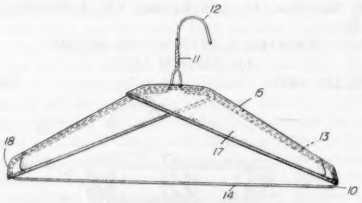
1. In a pants finishing machine having a base support and an upwardly positioned hot fluid supplying head thereon, a pair of transversely spaced-apart longitudinally forwardly extending support members, a side pair of upper and lower longitudinally forwardly extending creasing blades operatively positioned along each of said support members, cooperating upper and lower spread arms in the form of side pairs operatively connected at their outer ends to an associated side pair of said blades, and drive means operatively carried by said support members and connected to inner ends of said spread arm side pairs for expanding and contracting spacing between the upper and lower arms of said side pairs of spread arms to enlarge and shorten spacing between the associated side pair of creasing blades.

3,866,809
GARMENT HANGER WITH LOCK
Edwin E. James, Carson, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed May 22, 1973, Ser. No. 362,804
Int. Cl. A47j *51/098*
U.S. Cl. 223—88 **1 Claim**



1. A garment hanger employing a single elongated length of wire shaped to define a horizontally elongated wire body for receiving a garment and a coplanar open wire suspension main hook secured to the midpoint of the body and extending upward therefrom, the main hook being shaped from one end of the wire and having a shank integral with one end of the body, the other end of the wire being integral with the other end of the body and being wound together with the shank into a coil, the coil and the body having at the juncture thereof a hole lying in the plane of said body and said main hook, the free end of the main hook having an upwardly turned small hook coplanar with the main hook and said body, and an elongated closed flat loop pivotally disposed at one end in the hole, the other end of the loop being detachably engageable with said auxiliary hook.

3,866,810
GARMENT SHAPER
John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Nov. 15, 1973, Ser. No. 416,305
Int. Cl. A47j *51/086*
U.S. Cl. 223—98 **5 Claims**



1. The combination of a garment hanger and two shaping bodies on said hanger comprising:
   a. a garment hanger providing two dimensional support for a garment, said hanger having a central vertical shank connected to two oppositely disposed downwardly sloping shoulder elements and
   b. two elongated shaping bodies disposed one on each shoulder element of said hanger to impart a third dimen-

sion of support to the combination, each shaping body having the form of an inverted trough with a base extending over a shoulder element and side and end walls flaring outwardly and downwardly from the base. one end of each elongated shaping body having an angled portion with a flat surface smoothly converging to form said angle with said base and a downward flared lip on the distal end of the flat portion so that one such portion can overlie the other in nesting relationship adjacent the central vertical shank, and an aperture through each angled portion for threading the shank therethrough.

3,866,811

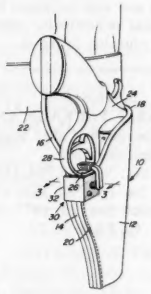
HOLSTER SAFETY CLASP

Robert L. Hamby, 1508 First Ave., Dodge City, Kans. 68701

Filed Apr. 16, 1973, Ser. No. 351,449

Int. Cl. F41c *33/02*

U.S. Cl. 224—2 B **8 Claims**



1. In combination with a handgun holster including a pair of side-by-side upstanding panels having spaced apart upper edges and pairs of corresponding upstanding side edges joined together to form an upwardly opening recess defining receptacle for receiving all but the butt and trigger guard portions of a downwardly directed handgun inserted barrel first into said recess, latch means including an elongated generally horizontally directed portion extending and having a longitudinal axis generally transverse of said panels and supported from said holster for axial back and forth shifting between operative and inoperative positions, means yieldingly biasing said latch means to a position with said horizontally directed portion in said inoperative position, and readily releasable latch retaining means operatively associated with said holster and latch means for retaining said latch means in the operative position thereof, said horizontally directed portion being disposed slightly above one pair of corresponding ends of said upper edges inwardly of the terminal ends thereof and extending through the planes of said panels adjacent the intersection of the upper ends of one pair of upstanding edge portions of said panels and the adjacent ends of the upper edges of said panels when in said operative position for preventing withdrawal of the handgun from the holster and being horizontally retracted to said planes when in the inoperative position.

3,866,812

MACHINE FOR AUTOMATIC STRINGING OR COLLARING OF PACKAGES WITH PLASTIC TAPE

Paul Gutjahr, Zurich, Switzerland, assignor to Erapa AG, Zumikon, Switzerland

Filed May 2, 1973, Ser. No. 356,513

Claims priority, application Switzerland, May 19, 1972, 7469/72

Int. Cl. B65h *17/22, 23/08*

U.S. Cl. 226—50 **8 Claims**

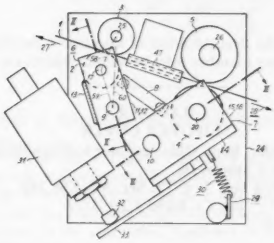
1. A tape drive means comprising:

a pair of rollers consisting of a first driving roller and a first counterpressure roller for advancing the tape;

a second driving roller and a second counterpressure roller for retracting the tape;

a seesaw upon which the driving rollers of the two pairs of rollers are mounted, the two counterpressure rollers being fixed, the first driving roller in a first position of the seesaw cooperating with said first counterpressure roller, and the second driving roller in a second position of the seesaw cooperating with said second counterpressure roller;

said seesaw being provided with two pivotal frames rotatable about corresponding swivel shafts and connected together by a guiding member and which carry, at a predetermined distance from the corresponding swivel shaft one driving roller each of the roller pairs;



two alternatingly energized driving motors having different rates of rotation, the driving motor having the higher rate of rotation used for both advancing the tape and retracting the tape, and the driving motor having the lower rate of rotation being used for generating the final tension in the tape during the final stage of tape retraction;

and wherein, when the respective driving roller is in its position of operation, each of the pivotable frames assumes a position such that each of the lines connecting the shafts of the driving rollers with the swivel shafts of the pivotable frames, and each of the lines connecting the shafts of the driving rollers with the shafts of the corresponding counterpressure roller include an acute angle with the line connecting the swivel shaft and the shaft of the corresponding counterpressure roller, whereby the reacting tensile force of the tape engaged by the active pair of rollers tends to rotate the corresponding pivotable frame by togglelever action.

3,866,813

AXIALLY ADJUSTABLE LIP SEAL ASSEMBLY

Donovan Y. Arnold, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 30, 1973, Ser. No. 420,721

Int. Cl. F16j *15/32*

U.S. Cl. 277—9 **9 Claims**

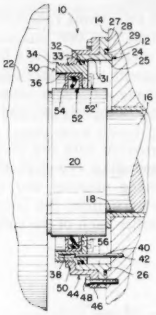
1. A rotary seal assembly for providing a dynamic seal between a rotating shaft and a stationary housing comprising a ring-shaped adapter member adapted to be mounted on a housing to circumvent a shaft,

a ring-shaped insert member adapted to be slidably received within said adapter member,

means forming a static seal between said adapter member and said insert member,

dynamic seal means carried by said insert member and adapted to contact a shaft in dynamic sealing engagement therewith, and

means coupling said insert member and said adapter member together for axial movement relative to each other



whereby the axial location of said insert member within said adapter member may be varied selectively.

3,866,814

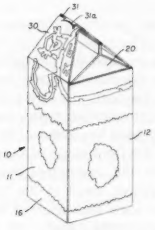
SLIPOVER COVER

William L. Bissler, Kent, Ohio, assignor to Consolidated Foods Corporation, Chicago, Ill.

Filed Feb. 7, 1973, Ser. No. 330,298

Int. Cl. B65d *3/26, 5/74*

U.S. Cl. 229—8 **9 Claims**



1. A decorative slipover cover for use with a beverage container having a closable opening in its top end, comprising:

A. a body having

1. a cross-sectional configuration corresponding to the cross-sectional configuration of the container,

2. a substantially closed bottom end, and

3. a pair of opposed top end flaps releasably engagable with each other and covering only a portion of the top of said container when they are engaged and forming an opening corresponding to the closable opening in said container.

3,866,815

CARTON WITH DECORATIVE FEATURE

John D. Desmond, Philadelphia, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Apr. 8, 1974, Ser. No. 458,817

Int. Cl. B65d *5/02*

U.S. Cl. 229—8 **3 Claims**

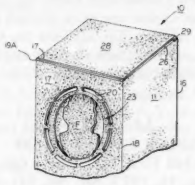
1. In a folding carton having a dimensional decorative element, said carton being formed from a cut and scored blank of paperboard or the like and comprising:

a. a plurality of foldably connected panels arranged to define a tube;

b. an ultimate panel and a penultimate panel foldably connected to each other with the penultimate panel being foldably connected to a distal end of said plurality of panels;

c. a viewing aperture in said penultimate panel;

d. a subpanel in said ultimate panel foldable through an angle of **180°** with respect to said ultimate panel;



e. said subpanel being viewable through said aperture;

f. said ultimate panel and said subpanel being disposed in position between said penultimate panel and the other distal panel of said plurality of panels.

3,866,816

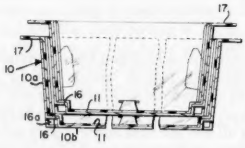
BOILABLE BAKEABLE PACKAGE AND METHOD

Robert P. Bemiss, Hillsborough, Calif., assignor to Robalex, Inc., Trustee, San Francisco, Calif.

Continuation-in-part of Ser. Nos. 83,704, Oct. 26, 1970, Pat. No. 3,715,853, and Ser. No. 154,784, June 21, 1971, Pat. No. 3,779,447. This application Jan. 23, 1973, Ser. No. 326,104

Int. Cl. B65d *15/22*

U.S. Cl. 229—14 B **5 Claims**



1. A tray or carton structure including an outer tray or part of paperboard having a bottom wall and four side walls, an inner tray or part comprising a formed layer of film conforming closely to the inside contour of said outer part of paperboard, said paperboard part and said film part individually lacking wall strength sufficient for handling as an individual container but together providing mutual reinforcing elements having a combined wall strength to provide for handling as a container for food or the like, and an interface between said film part and paperboard part being devoid of an adhesive said paperboard structure has upwardly divergent side walls providing for handling of said structures in nested relation as a stack, and said side wall including inwardly indented structured elements adjacent its bottom providing stop means for nesting of a similar paperboard structure therein and also providing an opening for communication with a source of vacuum.

3,866,817

PLASTIC PACKAGING TRAY, PARTICULARLY FOR BANANAS

Morell J. Holden, Jr., Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

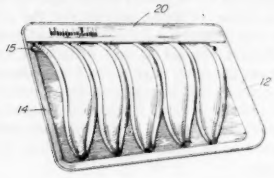
Filed Dec. 10, 1973, Ser. No. 423,034

Int. Cl. B65d *3/24*

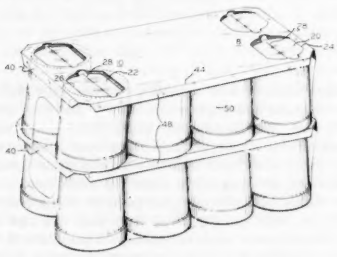
U.S. Cl. 229—15 **9 Claims**

1. Banana packaging tray comprising

a bottom wall (**10**) of approximately rectangular outline;
continuous upstanding side rims (**11, 12, 13, 14**) extending outwardly at an angle from said bottom wall (**10**) to form a surrounding rim about the support surface;
a projecting ridge (**15**) extending transversely across said bottom wall (**10**) and located spaced from and adjacent to one of said side rims (**11**) the ridge (**15**) projecting by a distance (h) which is a fraction of the height of projection of the side rims (**11–14**) above the bottom wall (**10**); and a cover flap (**20**) unitary with one of said side rims (**11**) and extending the width of the outer dimensions of the rims (**12, 14**) adjacent to said one rim (**11**), said cover flap being hinged (**21**) to said one rim, said flap (**20**) having a length (FL) of at least about the projected distance (PL) between the peak of the projecting ridge (**15**) and the edge of said one rim.



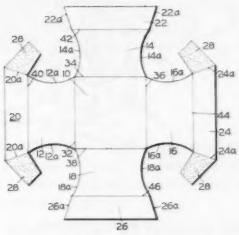
3,866,818
PACKAGING TRAY
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 29, 1972, Ser. No. 319,443
Int. Cl. B65d *5/20*
U.S. Cl. 229—30 **10 Claims**



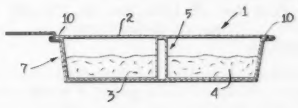
1. A tray for maintaining a plurality of articles at preselected locations relative one to the other, each article having a recessed portion, said tray having at least one flap, each flap having an edge connected to said tray along a hinged line of attachment, and each said flap having a portion which is of a width (w) greater than the width of the recessed portions of said articles, each said flap being positioned to be wedged into a respective recessed portion.

3,866,819
FLARED PRODUCE CARTON WITH CORNER CUT-OUTS
Henry R. Goebel, Ventura, Calif., assignor to Western Kraft Corporation, Camarillo, Calif.
Filed Aug. 6, 1973, Ser. No. 386,110
Int. Cl. B65d *5/20*
U.S. Cl. 229—30 **4 Claims**

1. A produce carton formed from a single blank of foldable paperboard and comprising:
a. a substantially rectangular bottom panel having four scored edges,
b. four side wall panels each hinged by one of said scored edges to the bottom panel,
c. at least one adjacent pair of side wall panels having at least one of their adjacent side edges concavely recessed to form a corner opening in the side walls of the assembled carton, and
d. a plurality of laterally extending glue flaps hinged by score lines to side edges of the side wall panels and arranged to overlap adjacent side wall panels for adhesive attachment thereto in the assembled condition of the carton,
e. each of the side wall panels having a scored upper edge and a side wall segment hinged by said scored upper edge to said side wall panel, the side wall segments having outwardly tapered side edges for outward flaring of the segments in the assembled condition of the carton, the glue flaps being hinged to said segments and being positioned to overlap the adjacent segments for adhesively securing them thereto.

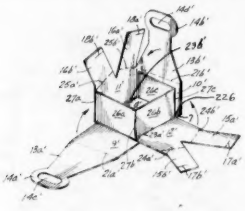


3,866,820
MULTI-COMPARTMENT CONTAINER
Horst Zumsteg, Neuhausen am Rheinfall, Switzerland, assignor to Swiss Aluminum Ltd., Chippis, Switzerland
Filed Oct. 5, 1972, Ser. No. 297,257
Claims priority, application Switzerland, Oct. 6, 1971, 14555/71
Int. Cl. B65d *85/72*
U.S. Cl. 229—43 **6 Claims**



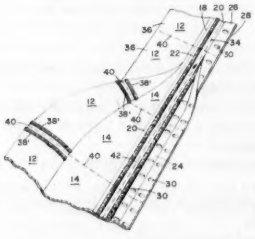
1. A multi-compartment container, especially for storing foodstuffs comprising
a heat sealable metal lid for hermetically closing said container including a laminated layer of plastic film or heat sealable lacquer
a multi-compartment inner-container for the stored foodstuff,
said inner container being made from plastic material and comprising
a side rim and partition walls
a single compartment metallic outer-container having a side rim;
said inner container conforming in size to said outer container whereby the inner container is supported by said outer container;
said heat sealable metal lid being heat sealable to the partition walls; and
said rims of said inner container and said rim of said outer container being assembled together with said heat sealable lid by heat sealing.

3,866,821
DISPOSABLE PORTABLE DOUBLE-BOTTOM-LIFT HANDLED CARTON
Henry C. Schaerf, 360 East 72nd Street, New York, N.Y. 10021
Filed Nov. 21, 1973, Ser. No. 417,971
Int. Cl. B65d *5/46, 25/22, 25/28*
U.S. Cl. 229—52 B **8 Claims**



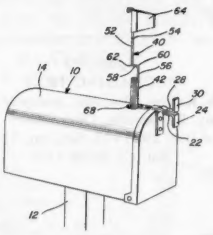
1. A portable container device comprising in combination: a sheet structure having opposite upper and lower substantially flat faces, the sheet structure including two portions separated by a line of severance extending substantially more than half a length of the sheet structure and a first fold line aligned with and in series with the line of severence and extending the remaining length of the sheet structure from the termination of the line of severence, the first fold line extending the remaining length between the two portions, and including at least two additional third and fourth fold lines spaced apart and parallel to one-another extending across both portions at points where the portions are severed from one-another, the third and fourth fold lines extending the width of the sheet structure, opposite ends of the length of one of the portions of the sheet structure including extensions shaped as opposite-end handle structures, and each of opposite ends of the length of the other portion including extensions shaped to form latching means for latching one end latching means to an opposite end latching means lockably.

3,866,822
ENVELOPE MAILING PIECE
Hans G. Faltin, 4135 Wilshire Dr., York, and William G. Faltin, 1434 1st Ave., York, both of Pa.
Filed Nov. 25, 1968, Ser. No. 778,428
Int. Cl. B65d *27/10*
U.S. Cl. 229—69 **21 Claims**



17. A multi-ply unit adapted to be attached to a carrying piece or sheet, said unit being formed from a sheet of thin material folded upon itself to form said multi-ply unit which comprises a pair of flatly abutting panels, means permanently connecting the edges of the opposite ends of said panels together, rows of separating means extending along said abutting panels in parallelism with said fold and spaced a limited distance therefrom to define respectively on opposite sides thereof a relatively narrow multi-ply attaching and feeding strip and an envelope of flatly abutting panels, said strip being defined by said fold and row of separating means, securing means parallel to and adjacent said row of separating means permanently connecting said envelope panels along one edge and the opposite edges of said panels being separable to provide an open edge to receive items within the envelope, and an additional panel substantially of similar size to one of said envelope panels foldably connected to the outer edge of one of said envelope panels adjacent said open edge of said envelope and adapted to be folded across said open edge of said envelope to close the same and overlie the other envelope panel from that to which it is foldably connected, and remoistenable adhesive applied to one surface of said additional panel adjacent the outer edge thereof and adapted to be activated and contact said opposite envelope panel from that to which said additional panel is foldably connected in order to seal the envelope in closed condition, said additional panel being adapted to be inscribed in connection with the use of said envelope.

3,866,823
RURAL MAILBOX SIGNAL
Robert E. Grayson, Rt.2, S., Great Falls, Mont. 59401
Filed Feb. 12, 1974, Ser. No. 441,842
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **6 Claims**

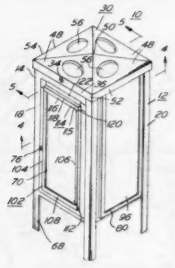


1. In combination with a mailbox of the type defining a horizontal tubular housing open at one end and provided with a hinged cover door for said one end pivoted along one marginal portion from a lower portion of the open housing end for swinging about a horizontal transverse axis in an upstanding plane between an upstanding closed position and an open position with the opposite marginal portion of said door swung outwardly and downwardly away from said one end of said housing, said opposite marginal portion of said door including a generally right-angled flange portion overlying, in slightly spaced position, the upper outer surface of the adjacent upper portion of the open end of said housing when said door is in the closed position, said housing and door including coacting means releasably securing said door in said closed position, a signal assembly comprising an upright metal expansion coil spring having abutting adjacent convolutions, one end of said coil spring being anchored at its lower end to an upper portion of the open end portion of said housing and the other end of said coil spring including a rod-like lengthwise extension provided with spaced oppositely angled right angle bends intermediate its opposite ends interconnected by a generally horizontal section of said extension extending therebetween, the free end portion of said extension remote from said coil spring including an enlargement visible from a distance, said spring being bendable, after said door has been opened, into inverted U-shaped configuration with the inverted horizontal section of said extension abutted against said upper outer surface and the free end of said extension and said enlargement directly in front of the open end of said housing and said door then being swingable to the closed position with said inverted horizontal section sandwiched between said upper outer surface and said right-angled flange portion.

3,866,824
RECEPTACLE DEVICE WITH ADVERTISING MEANS

Linford H. Lewis, 3408 Ashville St., Philadelphia, Pa. 19136

Filed Oct. 26, 1973, Ser. No. 410,041
Int. Cl. G09f 23/00
U.S. Cl. 232—43.2 6 Claims



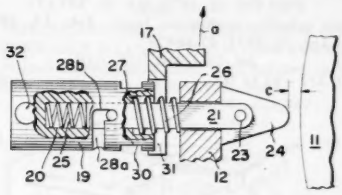
1. A receptacle device comprising a body having an outer surface providing front, side and rear vertical rectangular walls, said body having an opening at its top and a chamber therein for storing refuse, a top cover member hingedly secured at the top of said body along the rear vertical wall for movement between a first position enclosing the opening at the top of said body and a second position away from said opening, track means including one or more sets of track units respectively secured with one or more of the outer surfaces of the walls of said body with each of said units having an entrance at the top of said body for removably receiving advertising sheet material therein, said cover member enclosing the entrances of said track means and preventing removal therefrom or receipt therein of advertising sheet material when said cover member encloses the opening at the top of said body, and means for locking said top cover member in its first position, one of the walls of said body including a rectangular door with a top horizontal edge and outer and inner vertical surfaces enclosing a side opening of said body communicating with its chamber, said door being hinged about a vertical axis to move between closed and open positions, a set of track units secured with the outer surface of said door having an entrance at the top thereof for removably receiving advertising sheet material therein, and a track closure element supported by said door having a cover portion positioned over and enclosing the entrance of said last set of track units and a retaining portion extending behind said door, said retaining portion being concealed when said door is in its closed position and exposed when said door is in its open position, said track closure element being secured with said door against removal when said door is in its closed position and being removable from over said last set of track units for opening its entrance when the door is in its open position, and including locking means for locking said door in its closed position.

3,866,825
MOTION SENSING LOCK FOR SECURING A COVER OR GUARD FOR A ROTATABLE MEMBER SUCH AS A CENTRIFUGAL CONTACTOR SHAFT

Richard J. Balazer, deceased, late of Saginaw, Mich., and James A. Farrand, administrator, Saginaw, Mich., assignors to Baker Perkins, Inc., Saginaw, Mich.

Filed Nov. 24, 1972, Ser. No. 308,967
Int. Cl. B04b 7/06
U.S. Cl. 233—1 B 14 Claims

1. A machine comprising: a framework, a drivable part, such as a centrifugal rotor, movably mounted on said framework; a releasable guard for the part; a latch part mounted on one of said framework and said guard; a rotatable lock member having a cylindrical bore supported for rotary movements about the axis of said bore between a position in which it coacts with said latch part to fix said guard in a position in which it cannot be released and a position in which said guard

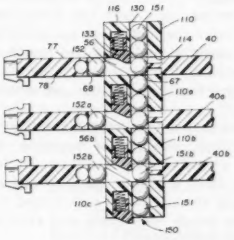


can be released; and motion sensing element means slidably received in said rotatable lock member for engaging said drivable part and controlling whether said lock member can be rotated between said positions.

3,866,826
VOTING MACHINE

Cothburn M. O'Neal, Dallas; Alfred M. Mayo, Richardson, both of Tex., and George William Childs, deceased, late of Dallas, Tex. (by Patricia M. Childs, executrix), assignors to Riverside Press, Inc., Dallas, Tex.

Filed Nov. 24, 1972, Ser. No. 309,174
Int. Cl. G07c 13/00
U.S. Cl. 235—54 A 10 Claims



1. A mechanical interlock for limiting the number of selections permissible in a voting machine having a plurality of aligned moveable voting keys, said interlock comprising:

cam block means interposed between adjacent voting keys having a through passage and a blind receiving bore therein, said block means being moveable between a first and second position relative to said voting keys;

said keys having first and second bores therethrough whereby said first bores and said block means in said first position define an aligned passageway and said second bores carry displacement balls therein;

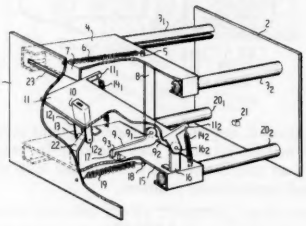
shiftable ball means forming an aligned column of balls in said passageway; and

cam means associated with each of said keys at said first and second bores, whereby movement of said cam block means to said second position establishes a selection group with said receiving bore at one limit and whereby actuation of a predetermined number of said keys to said second position in said group will displace said column of balls a predetermined distance toward said receiving bore by introducing one of said displacement balls therein for each key actuated, thereby blocking actuation of additional keys when said receiving bore is fully occupied by displaced balls.

3,866,827
MAGNETIC CARD APPARATUS

Atsushi Obata, Kitakata, and Mamoru Namikawa, Tokyo, both of Japan, assignors to Tokushu Seiko Co., Ltd. and Tokyo Magnetic Printing Co., Ltd., both of Tokyo, Japan

Filed Feb. 16, 1973, Ser. No. 333,172
Claims priority, application Japan, Feb. 17, 1972, 47-17015; Apr. 28, 1972, 47-50875
Int. Cl. G06k *7/08, 7/10*
U.S. Cl. 235—61.11 D **6 Claims**



1. Apparatus for reading data recorded on a surface of an information bearing medium, said apparatus comprising:

means including first and second guide rods having opposing grooves formed therein and defining a guide path between a first entrance position and a second position for receiving an information bearing medium to be directed along said guide path,

a first assembly movable along said first and second guide rods in response to the insertion of the information bearing medium,

first spring means for urging said first assembly against movement from the first to the second position,

a read head assembly and third and fourth guide rods for receiving said read head assembly for movement along said third and fourth guide rods and adjacent said guide path,

release means including a detent arm pivotally mounted upon said first assembly for engaging said read head assembly, whereby upon insertion of the information bearing medium, said first assembly and said read head assembly are moved toward said second position,

second spring means for biasing said read head assembly toward said first position,

said release means being responsive to disposition of said read head assembly at said second position for releasing said read head assembly to permit said second spring means to move said read head assembly toward said first position, and

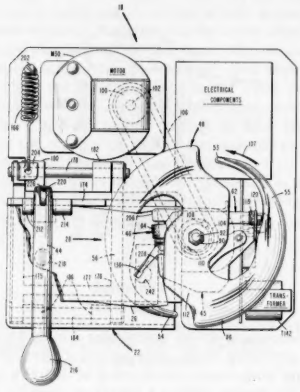
said read head assembly further including a read head support member, carrying a read head thereon, pivotally mounted upon said read head assembly and biased to direct said read head toward said guide path, whereby said read head scans the surface of the information bearing medium during movement by said second spring means of said read head assembly from said second to said first position.

3,866,828
COUNTING DEVICES

Robert D. Young, Accord, N.Y., assignor to Canyon Research Corporation, Accord, N.Y.

Filed Apr. 13, 1973, Ser. No. 350,974
Int. Cl. B61l *1/16*
U.S. Cl. 235—98 R **24 Claims**

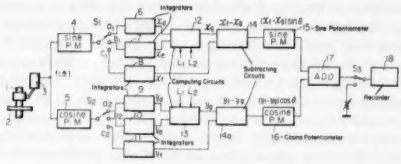
1. Apparatus for counting the number of items in a stack thereof, comprising: a support means; means for immobilizing a stack of items to be counted against said support means, a cyclically operable means for displacing like portions of successive items in the stack thereof thus immobilized; means for counting the number of like portions so separated and thus the number of items in the stack; and means including a member relative to which said displacing means is free to move displaceable by each said item as the like portion thereof is displaced to actuate said counter and change the count shown thereby.



3,866,829
METHOD AND APPARATUS FOR MEASURING CONCENTRICITY

Mitsuru Egawa; Masahiro Akahane, and Tomohiro Sanada, all of Tokyo, Japan, assignors to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Filed June 14, 1973, Ser. No. 369,889
Int. Cl. G06g *7/48*
U.S. Cl. 235—151.3 **9 Claims**



1. In the method of measuring the concentricity of a workpiece, said workpiece being positioned with a reference axis of the workpiece inclined relative to an axis of rotation of a measuring system, where the least squares circles computed from the measured contour of the workpiece is a measurement circle, the improved steps resulting in an ascertainment of the coordinates of a measurement circle comprising:

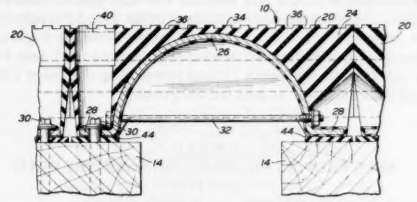
obtaining first signals representing the central coordinates of two reference circles defined relative to the workpiece; obtaining second signals representing the distance between the reference circles and the measurement circle; computing the coordinates of a reference point of the measurement circle where said reference point is the point of intersection of the line connecting the centers of said two reference circles and the plane of said measurement circle, from said first and second signals, thereby ascertaining the coordinates of the center position of the measurement circle.

3,866,830

ELASTOMERIC RAILROAD CROSSING STRUCTURE

Richard D. Hein, and Gary L. Fordyce, both of Wabash, Ind., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Sept. 7, 1973, Ser. No. 395,207
Int. Cl. E01b 27/28
U.S. Cl. 238—8 28 Claims



1. An elastomeric railroad crossing pad member comprising:

A. an elongated arch member having an upwardly extending arch and including horizontal flanges extending from each side of said arch,

B. said arch member being of width substantially the same as the center spacing of adjacent railroad ties,

C. said arch member being adapted for respective connection through said flanges to adjacent railroad ties with the longitudinal axis of said arch member disposed substantially parallel to the axes of said railroad ties,

D. a plurality of tension support means connected in chordal relation across the arch of said arch member and along the tops of said flanges, and

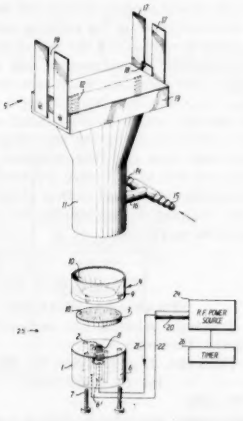
E. an elastomeric pad body defining a horizontal upper surface and bonded to the upper surfaces of said arch and said flanges.

3,866,831

PULSED ULTRASONIC NEBULIZATION SYSTEM AND METHOD FOR FLAME SPECTROSCOPY

Medona Bonner Denton, Tucson, Ariz., assignor to Research Corporation, New York, N.Y.

Filed Oct. 10, 1973, Ser. No. 404,919
Int. Cl. B05b 17/06; G01n 21/56
U.S. Cl. 239—4 15 Claims



1. A pulsed ultrasonic nebulizer system for flame spectroscopy, which comprises:

means for receiving a liquid sample to be analyzed;

means for generating a pulsed RF signal; and

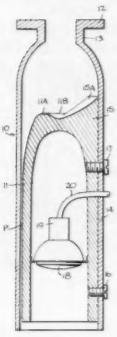
transducer means responsive to said pulsed RF signal for nebulizing said liquid sample into an aerosol spray.

3,866,832

NOZZLE ASSEMBLY FOR PRODUCING AN INTERNALLY ILLUMINATED WATER COLUMN

Isamu Noguchi, Long Island City, N.Y., assignor to Noguchi Fountain and Plaza, Inc., Cambridge, Mass.

Filed Dec. 27, 1973, Ser. No. 428,749
Int. Cl. F21p 7/00
U.S. Cl. 239—18 10 Claims



1. A nozzle assembly for producing a coherent column of water comprising:

A. a flow tube having a water inlet,

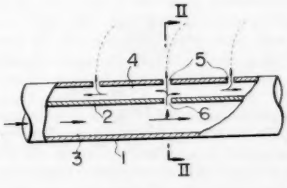
B. a core piece coaxially mounted within the tube by a laterally-extending pedestal to create a longitudinal slot in the hollow water column emitted from the mouth of the flow tube to expose the interior of the column to the atmosphere, the head of the core piece which faces said inlet being rounded to minimize the impact of water thereon.

3,866,833

IRRIGATION HOSE

Osamu Shibata, Suita; Susumu Kojimoto, Ibaragi, and Takeshi Okuno, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sept. 17, 1973, Ser. No. 397,727
Claims priority, application Japan, Sept. 20, 1972, 47-94886
Int. Cl. B05b 1/20
U.S. Cl. 239—76 2 Claims



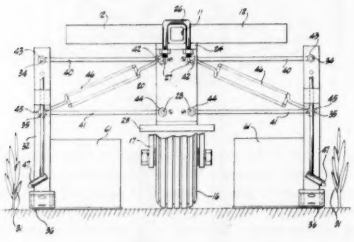
1. An irrigation hose for agriculture comprising a plastic pipe having a plurality of flow paths each partitioned independently by diaphragms helically formed and extending longitudinally, that portion of an outer wall of the plastic pipe which defines at least one of the flow paths being formed with small

bores properly spaced for sprinkler use along its length, and serving as a constant pressure path while at least one of the other flow paths, separated from the constant pressure path by the diaphragm, serves as a supply path, and small bores communicating both the constant pressure path and the supply path formed in the diaphragm separating the both paths along its length.

3,866,834
CULTIVATOR ASSEMBLY

Jefferson C. Shannon, c/o Shannon Tractor Co., Inc., P.O. Box 808, Yazoo City, Miss. 39194

Filed Aug. 29, 1973, Ser. No. 392,482
Int. Cl. A01m *7/00, 15/00*
U.S. Cl. 239—167 **11 Claims**



1. In a cultivator adapted to travel along and cultivate row crops:

a. a cultivator frame,

b. a mounting bracket secured to the frame,

c. a side frame spaced laterally from each side of the mounting bracket, the side frames being adapted for location at the sides of adjacent crop rows, and the side frames having ground-engaging members for following the contour of the ground along the sides of adjacent crop rows,

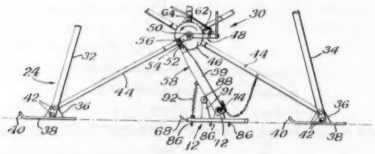
d. a pair of spaced, substantially parallel wing arms pivotally connected to each side frame and to the mounting bracket to provide a parallelogram linkage that enables independent, substantially vertical movement of the side frames in response to the ground contour, and

e. means carried by the side frames for treating the adjacent crop rows.

3,866,835
PROPELLING SHOE FOR USE IN AN IRRIGATION SYSTEM

Leo J. Dowd, 117 S. Parkway, Columbus, Nebr.

Filed Mar. 11, 1974, Ser. No. 449,629
Int. Cl. B05b *3/02;* **B62m** *27/02, 29/02*
U.S. Cl. 239—177 **6 Claims**

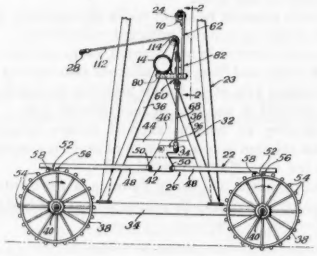


1. In an irrigation system of the type which includes an elongated, substantially horizontal water distribution pipe, means for pivotally mounting said pipe at one of its ends, means spaced along said pipe for supporting said pipe between one end and the other end thereof, and means for pivoting said pipe about said mounting means, said pivoting means including shoe means for drivably engaging said ground, the improvement comprising, in combination, shoe means having a substantially planar lower ground contacting surface, aperture means defined in said planar surface, drive shaft means pivotally interconnected to said shoe means, said drive shaft means being pivotable relative to said shoe means between first and second positions, cleat means operatively interconnected to said drive shaft means, said cleat means including planar means guidably received by said aperture means transversely of said planar surace and movable into said ground, said planar means being movable in and out of the ground in response to movement of said drive shaft means between a ground disengaged condition when said shaft means is at said first position, and a maximum ground penetrating condition when said shaft means is at said second position.

3,866,836
SELF PROPELLED IRRIGATION SYSTEM WITH CLUTCH

Leo J. Dowd, 117 S. Parkway, Columbus, Nebr.

Filed June 17, 1974, Ser. No. 479,860
Int. Cl. B05b *3/12;* **B60p** *3/30;* **A01m** *7/00*
U.S. Cl. 239—177 **12 Claims**



1. In an irrigation system of the type which includes an elongated, substantially horizontal water distribution pipe, and a plurality of laterally spaced aligned support means for said pipe, the improvement comprising, in combination, an arm supported by said support means, a reciprocal drive cable for moving said arm, wheels mounted on said support means for movement of said support means and said pipe along the ground, a drive mechanism for rotating said wheels, a connecting member for imparting the movement of said arm to said drive mechanism for rotation of said wheels, a control cable having a first condition when said support means lags behind other support means and having a second condition when said support means moves ahead of other support means, and clutch means having an engaged position when said control cable is at said first condition, for transmitting motion from said arm to said drive mechanism, and having a disengaged position when said control cable is at said second condition for stopping the transmission of motion from said arm to said drive mechanism.

3,866,837
SPRAY ARM BEARING

Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 15, 1973, Ser. No. 406,647
Int. Cl. B05b *3/06*
U.S. Cl. 239—261 **3 Claims**

1. A dishwashing machine including a tub for receiving articles to be washed and a spray arm rotatably arranged in said tub for spraying liquid onto said articles;

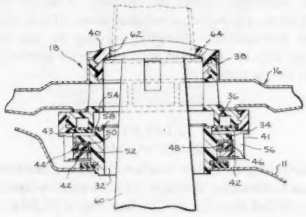
a stationary tubular liquid receiving hub member arranged in the bottom wall of said tub defining a liquid inlet;

a tubular spray arm support member mounted on said hub member for rotation relative thereto when liquid is received through said hub member;

said spray arm support member having a circumferentially disposed wall spaced outwardly from and parallel to said hub member;

annular retaining means integral with said hub member projecting toward said circumferentially disposed wall;

annular support means integral with said circumferentially disposed wall projecting toward said hub member below said annular retaining means;

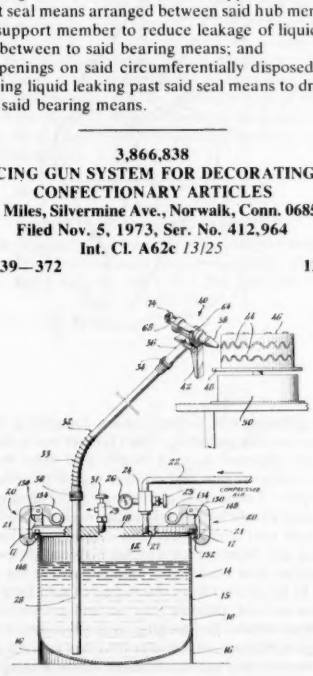


friction reducing bearing means arranged between said retaining means and said support means for allowing rotation of said spray arm support member when the thrust of liquid through said liquid inlet causes axial movement of said spray arm support member and engagement of said bearing between said stationary annular retaining means and said annular support means;

resilient seal means arranged between said hub member and said support member to reduce leakage of liquid passing therebetween to said bearing means; and

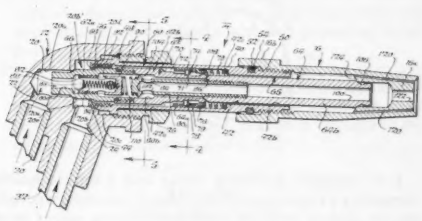
drain openings on said circumferentially disposed wall for allowing liquid leaking past said seal means to drain away from said bearing means.

3,866,838
ICING GUN SYSTEM FOR DECORATING CONFECTIONARY ARTICLES
George N. Miles, Silvermine Ave., Norwalk, Conn. 06850
Filed Nov. 5, 1973, Ser. No. 412,964
Int. Cl. A62c *13/25*
U.S. Cl. 239—372 **12 Claims**



1. An icing gun system for decorating confectionary articles with icing material comprising a pressurizable container adapted to hold the icing material, said container having a removable cover, clamp means for releasably clamping the cover onto the container, an applicator gun having a tip opening for discharging the icing material onto the confectionary articles to be decorated, a flexible hose line connectible between the pressurizable container and the gun for feeding icing material to the gun, a manually operable trigger on the gun, a movable valve member which is exposed to the pressure of the icing material and is actuatable by said trigger for controlling the flow of icing material out of said tip opening, and a second movable member in opposed relationship to said valve member and connected to said valve member, said second movable member being exposed to the pressure of the icing material for balancing out the effect of the pressure on said valve member, whereby the valve member is readily controllable by said trigger.

3,866,839
TORCH HEAD CONSTRUCTION
Edward J. Magner, 197 Elk St., Buffalo, N.Y. 14210
Filed Aug. 2, 1974, Ser. No. 494,058
Int. Cl. B05b *7/06*
U.S. Cl. 239—416.5 **6 Claims**



1. A torch head construction comprising in combination:

a torch head defining an end opening socket and oxygen and fuel gas inlet ports entering said socket at points spaced lengthwise thereof;

an extension assembly having a sleeve and an inner assembly extending lengthwise within said sleeve, said inner assembly having a rearwardly disposed end seated within said socket and cooperating therewith to define an oxygen chamber communicating with said oxygen inlet port, said inner assembly defining an oxygen passageway opening adjacent said rearwardly disposed end into said oxygen chamber and opening through a forwardly disposed end of said inner assembly, said sleeve having a rearwardly disposed end portion seated within said socket and cooperating therewith and said inner assembly to define a fuel gas chamber communicating with said gas inlet port, said sleeve and said inner assembly additionally cooperating to define a fuel gas passageway opening into said fuel gas chamber adjacent said rearwardly disposed end portion and opening through a forwardly disposed end portion of said sleeve, said inner assembly defining a valve device including an operator defining said forwardly disposed end of said inner assembly and movable between forwardly extended and rearwardly retracted positions for blocking and unblocking flow of oxygen through said oxygen passageway, respectively, and means for normally maintaining said operator in said forwardly extended position; and

a series of torch tips removably mounted one at a time to said forwardly disposed end portion of said sleeve, said series of tips including welding and cutting tips of generally cup-shaped configuration characterized as including base walls and side walls having tip mounting rim portions, said welding tip having an essentially centrally disposed fuel gas outlet opening extending through said base wall thereof, said cutting tip having an essentially centrally disposed oxygen outlet opening and a plurality of gas outlet openings arranged radially outwardly of said oxygen opening extending through said base wall thereof,

said welding tip having means engageable with said sleeve for maintaining an inner surface of said base wall thereof disposed forwardly of said operator, and said cutting tip having an inner surface of said base wall thereof arranged to engage said operator to provide a fluid seal peripherally of said oxygen opening thereof and said oxygen passageway and to maintain said operator in said rearwardly retracted position.

3,866,840

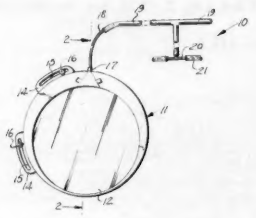
VEHICLE HEADLIGHT DE-FILMING DEVICE

John Harkrider, P.O. Box 5671, Irving Tex. 75062

Filed Aug. 14, 1973, Ser. No. 388,238

Int. Cl. B60q *1/00, 3/00*

U.S. Cl. 240—7.1 R **4 Claims**



1. A headlight de-filming device and a vehicle headlight comprising a ring integral with a pair of ears along a periphery thereof, slots in said ears receiving mounting screws secured to a vehicle, said ring being installed around a sealed beam headlight of said vehicle, a spray nozzle secured to said ring, an outlet of said nozzle being adjacent a front edge of said ring, said nozzle being connected by flexible hose means through a pump to a windshield washer water supply.

3,866,841

SUBMERSIBLE PUMP EQUIPPED WITH CUTTER

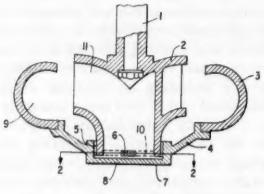
Masakuni Iwahara, Kishiwada, Japan, assignor to Elepon Technical Center Kabushiki Kaisha, Osaka Prefecture, Japan

Filed May 17, 1973, Ser. No. 361,244

Claims priority, application Japan, Sept. 11, 1972, 47-106269

Int. Cl. B02c *18/40*

U.S. Cl. 241—46.11 **2 Claims**



1. A submersible pump equipped with cutters for cutting foreign material carried by the liquid being pumped comprising:

a. a rotating vane-wheel having a circular lower inlet portion, a circular outlet portion, and a cutter bar carried at the circular lower inlet portion thereof, said cutter bar being flat and extending diametrically across said circular lower inlet portion in a plane perpendicular to the axis of rotation of said vane-wheel, with the area above said cutter bar being entirely open in said vane-wheel and said circular lower inlet portion likewise being open except for said cutter bar so as to minimize flow restriction through said vane-wheel,

b. a fixed pump casing having a lower inlet portion concentrically arranged around the circular lower inlet portion of said vane-wheel, said casing being formed with cutter means extending into said lower inlet portion of said casing below said cutter bar of said vane-wheel, said cutter means comprising flat bar means extending diametrically across said lower inlet portion parallel to and spaced from said cutter bar carried by said vane-wheel, the lower inlet portion of said pump casing being entirely open except for said flat bar means so as to not significantly adversely affect the volume of liquid delivered to said pump, the rotation of said vane-wheel, and thus the cutter bar carried thereby, serving to cut into pieces foreign objects pumped into said inlet portions with the liquid being pumped.

3,866,842

GRINDING MILL

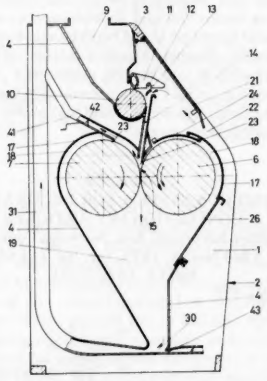
Robert Linzberger, Saint Gallen-Bruggen, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, Switzerland

Filed Jan. 23, 1974, Ser. No. 435,854

Claims priority, application Switzerland, Jan. 24, 1973, 1012/73; Dec. 6, 1973, 17103/73

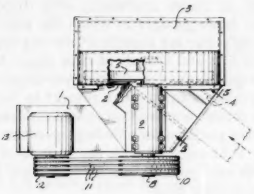
Int. Cl. B02c *23/02*

U.S. Cl. 241—47 **26 Claims**



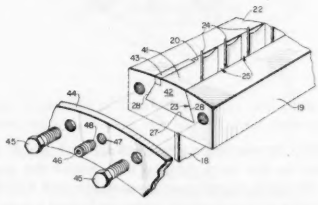
1. In a grinding mill, a combination comprising wall means defining a housing including a feed hopper and a downwardly convergent chamber located below said feed hopper and having an upper region and a lower region provided with an outlet; a pair of cooperating grinding rollers arranged in substantial axial parallelism in said upper region of said chamber spaced from said feed hopper and defining with one another a grinding gap from which ground material drops into said lower region; first pneumatic conduit means for conveying material to be ground from the region of said feed hopper to the region of said grinding gap; second pneumatic conduit means; feed means for feeding ground material from said lower region through said outlet into said second pneumatic conduit means; and suction conduit means having one open end portion communicating with said second pneumatic conduit means, and another open end portion located proximal to said grinding gap for aspirating air from said first pneumatic conduit means into said second pneumatic conduit means via the region of said grinding gap, whereby to maintain suction in the region of said grinding gap.

3,866,843
OVERHUNG DISK CHIPPER
Edward O. Lunn, Vancouver, British Columbia, Canada, assignor to Nicholson Manufacturing Company, Seattle, Wash.
Filed Aug. 27, 1973, Ser. No. 391,628
Claims priority, application Canada, Sept. 5, 1972, 150963
Int. Cl. B02c *18/14*
U.S. Cl. 241—55 4 Claims



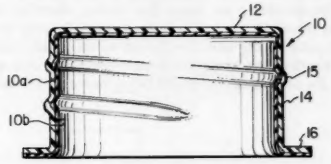
1. An overhung disk chipper comprising a base, a generally horizontal drive shaft carried rotatively by said base and having a cantilever end portion, an overhung chipping disk carried rotatively by said cantilever end portion of said drive shaft for upward movement of the portion of said chipping disk at one side of said shaft and downward movement of the portion of said chipping disk at the other side of said shaft and said chipping disk carrying chip-cutting bits on the side thereof to which said shaft is connected for cutting wood into chips, a housing for said chipping disk having an upright wall at the same side of said chipping disk as said shaft, and an elongated feed spout at the same side of said chipping disk as said shaft and housing upright wall, having an end connected to said housing upright wall only at a location above said shaft and having its length disposed substantially parallel to a horizontal plane and at an acute angle relative to the upwardly-moving portion of said chipping disk for guiding pieces of wood to be cut into chips to move lengthwise of such wood pieces and lengthwise of said feed spout through said housing upright wall to said chipping disk.

3,866,844
SHAVINGS MAKING MACHINE
W. T. S. Montgomery, Jacksonville, Fla., assignor to Montgomery Industries International Inc., Jacksonville, Fla.
Filed Aug. 16, 1973, Ser. No. 388,799
Int. Cl. B02c *18/06*
U.S. Cl. 241—282.2 17 Claims



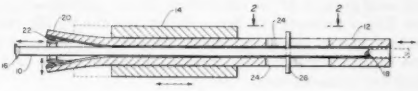
1. A rotor assembly for a shavings making machine or the like comprising a rotor having on its periphery a series of circumferentially spaced parallel longitudinal rows of relatively short knife blades, said knife blades being mounted in spaced relation longitudinally of the rotor and all being similarly inclined relative to an intersecting diametrical plane containing the rotor axis and each said row comprising a series of spacer elements and a series of knife blades separated by and clamped between adjacent spacer elements.

3,866,845
CONTAINER CLOSURE WITH LINER AND METHODS OF MAKING THE SAME
Frederick D. Keeler, Trumbull, and Carleton Ellis, Jr., Southport, both of Conn., assignors to The KLM Company, Stratford, Conn.
Filed May 18, 1973, Ser. No. 361,636
Int. Cl. B65d *53/00*
U.S. Cl. 215—341 10 Claims



1. A thermoformed container closure comprising:
an outer shell of plastic material of substantially uniform thickness throughout except in the areas where deformed and having a top wall and a skirt wall depending therefrom,
and a thermoformed liner of a material different from and softer than said shell material and of substantially uniform thickness throughout except in the areas where deformed bonded to the interior of said outer shell throughout the entire inner surface area of said shell.

3,866,846
WIRE WRAP TOOL
Ted C. Dorsey, 4479 Westmont St., Ventura, Calif. 93003
Filed Sept. 25, 1972, Ser. No. 292,055
Int. Cl. B21f *3/04*
U.S. Cl. 242—7.06 6 Claims

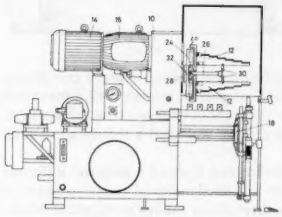


1. A tool for removing and replacing coil wire wraps comprising:
a first tubular member having a raised external helical groove having a predetermined depth at one end;
a second tubular member concentric with the first tubular member and having at least one flexible collet jaw at one end adjacent to the helical groove of the first tubular member;
a third tubular member slidable over and concentric with the second tubular member to force the collet jaw of the second tubular member against the helical groove of the first tubular member whereby a coil wire wrap may be retained in the tool.

3,866,847
APPARATUS FOR WINDING COILS FOR STATORS OF ELECTRICAL MACHINES
Hans Droll, An der Rosenhelle 4, 6369, Niederdorfelden, Germany
Filed Dec. 14, 1972, Ser. No. 314,964
Claims priority, application Germany, Dec. 15, 1971, 2162145
Int. Cl. B21f *3/04*; H02k *15/04*; H01f *41/06*
U.S. Cl. 242—7.09 8 Claims

1. An apparatus for winding coils for stators of electrical machines, comprising: a frame, a hollow shaft rotatably mounted in the frame, a face plate means fixed to the hollow shaft and extending radially outwardly therefrom, means

formed on said face plate for providing at least two radially extending guide surfaces, a sliding member on each guide surface, a former portion fixedly mounted on each sliding member to move radially therewith, a connecting means connecting each guide surface to its respective sliding member, each said connecting means including means for supporting its respective sliding member on its respective guide surface so as to form a driving connection from said shaft via said face plate and said connecting means to said sliding member and to its respective former, said connecting means further including means for mounting its respective sliding member so as to constrain the sliding member to move radially only in a plane perpendicular to the axis of rotation of the shaft, the former formed by the former protions thus receiving coil windings thereon about its periphery and being movable by said radial



movement in said plane to at least two winding cross-sections and a smaller cross-section for drawing off a wound coil, a rod extending through the said hollow shaft to a position between said former portions, a rod mounting means for mounting the rod for axial movement relative to the shaft and for rotatable movement with the shaft, at least one link pivotally connecting the rod to each former portion such that upon axial movement of the rod the links pivot and urge their respective former portions to move radially by their sliding members sliding on their respective facing plate means guide surfaces, whereby the axial position of the rod determines the radial position of the former portions and hence determines the former cross-section, and including stop means for positively stopping the rod to locate the position thereof corresponding to said at least two cross-sections.

3,866,848

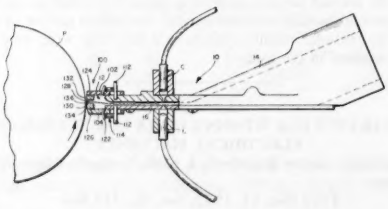
END FINDING NOZZLE

Samuel L. Abbott, Wilton, N.H., assignor to Abbott Machine Co., Inc., Wilton, N.H.

Continuation of Ser. No. 207,245, Dec. 13, 1971, abandoned. This application Jan. 3, 1974, Ser. No. 430,470

Int. Cl. B65h *54/22*

U.S. Cl. 242—35.6 E **2 Claims**



1. End finding apparatus for finding an end of yarn on a package of yarn and withdrawing it therefrom, said apparatus comprising means for supporting a package of yarn for rotation about a predetermined axis, means supporting an end finding nozzle adjacent the package at a predetermined fixed distance from the surface of the package for directing a flow of air across the surface of the package to carry an end of yarn into the nozzle, said nozzle having a narrow elongate mouth confronting and extending along the surface of the package substantially parallel to the axis of rotation thereof, a pair of lip plates each comprising a single elongate rigid flat plate having a uniformly straight leading edge, said lip plates being mounted on the roof and bottom of the mouth for movement with the nozzle toward and from the package, pins fixed to the roof and bottom of the mouth with their axes perpendicular to the said lip plates on which the lip plates are pivotally mounted, said lip plates containing slots disposed at right angles to their leading edges in which the pins are received such that the lip plates are capable of moving angularly about the axes of the pins and linearly at right angles to the leading edges and springs mounted on the pins yieldingly urging the lip plates to distended positions with respect to the mouth such that when the mouth is moved up to said predetermined position adjacent the package for a finding operation the lip plates are yieldingly held engaged with the surface of the package and wherein at said position the lip plates are freely pivotal about the axes of said pins.

3,866,849

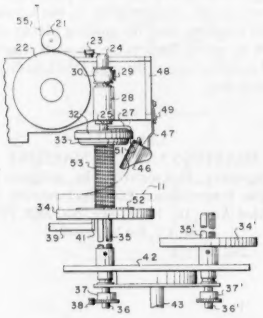
APPARATUS FOR PRODUCING A NOVEL YARN PACKAGE

Paul W. Eschenbach, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 211,137, Dec. 22, 1971, abandoned, which is a division of Ser. No. 92,078, Nov. 23, 1970, Pat. No. 3,675,864. This application Nov. 19, 1973, Ser. No. 417,159

Int. Cl. B65h *54/80*

U.S. Cl. 242—47 **1 Claim**

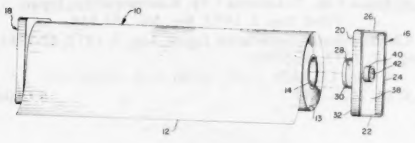


1. Apparatus for winding a yarn package with a high degree of uniformity in the yarn density throughout the package comprising: means to supply yarn, a rotatable yarn distributing means, rotatable yarn collecting means including a supporting base, a central core and yarn deflecting means supported between said yarn distributing means and said yarn collecting means to periodically deflect yarn from said yarn distributing means toward said central core, means for advancing said yarn collecting means toward said yarn distributing means to a predetermined spacing therefrom prior to delivery of yarn to said yarn collecting means, and means for moving said yarn collecting means away from said yarn distributing means as yarn is deposited on said yarn collecting means at a rate sufficient to maintain the spacing between said yarn distributing means and the yarn deposited on said yarn collecting means.

3,866,850
STRIP CHART HOLDING DEVICE

George H. More, Houston, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed June 26, 1972, Ser. No. 266,169
Int. Cl. B65b *19/02*
U.S. Cl. 242—68.4 6 Claims



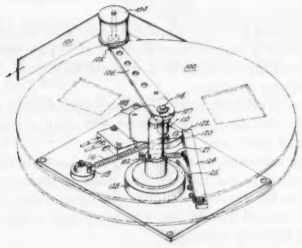
1. A roll strip chart holder for engaging a generally cylindrically shaped roll of strip chart for use with a recorder, comprising:

a body member having a substantially flat surface for positioning at one end of the roll of strip chart to bear against the edges of chart paper carried upon a roll core for strip chart paper, the body member having a generally centrally disposed hub for rotatably engaging a mount associated with a recorder, the body member having at least two portions which protrude outwardly from the centrally disposed hub to integrally form a substantially flat landing extending beyond the periphery of the roll of strip chart to provide edge alignment of the strip chart with the roll core and support for the roll of strip chart during handling.

3,866,851
HIGH SPEED IMPACT PRINTER

Robert J. Brooks, Bellevue, Wash., assignor to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Oct. 3, 1973, Ser. No. 403,277
Int. Cl. B65h *25/22*
U.S. Cl. 242—75.43 8 Claims



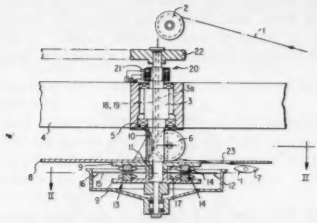
6. An apparatus of claim 5, wherein said braking means is rotatable about a second axis spaced apart from said first axis.

3,866,852
COIL WINDING MACHINE

Horst Kunz, Friedhofstrasse 24, Mandeln, Germany

Filed Dec. 18, 1973, Ser. No. 425,812
Claims priority, application Germany, Dec. 18, 1972, 2262077
Int. Cl. B21c *47/14*
U.S. Cl. 242—82 15 Claims

1. In a wire coiling machine having a coiling winding head with a freely rotating coiling disk which floats on a drive shaft extending through a stationary housing and being non-rotatably connected to a rotor with which said coiling disk is in driving relationship via an equalizing gear means, the wire running through a channel in said drive shaft and over an adjacent guide pulley onto said coiling disk, the improvement wherein said equalizing gear means is secured to a bearing support inside said coiling disk and is designed as a direct

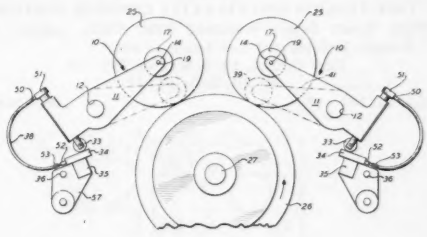


remote-controlled non-contacting intermediate power system for effecting a controlled slow rotation, if any, between said rotor and said coiling disk.

3,866,853
REWIND ARM ASSEMBLY

Elvin A. Mastriani, Roseland, and Frank A. Pozar, Succasunna, both of N.J., assignors to Arrow Converting Equipment, Inc., Fairfield, N.J.

Filed Apr. 3, 1973, Ser. No. 344,251
Int. Cl. B65h *17/08*
U.S. Cl. 242—65 19 Claims



1. In a rewinding arm assembly for use in a machine for rewinding a drum onto a rewinding roll of movably mounted rewind arm,

a. a piston movably mounted at one end of said arm and having a free end extending therefrom,

b. a cam plate mounted relative to the piston for cam engagement of the free end of the piston therewith, and

c. means for moving the piston to urge the free end thereof into engagement with the cam plate, to thereby urge the other end of the rewind arm toward the winding drum.

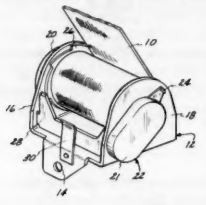
3,866,854
SEAT BELT LOCKING MECHANISM AND ALARM SYSTEM

William C. Wehner, Clarence Center, N.Y., assignor to International Engineering Service, Inc., Troy, Mich.

Filed Nov. 18, 1971, Ser. No. 199,952
Int. Cl. B65h *75/48*; B60q *1/26*
U.S. Cl. 242—107.4 11 Claims

1. An alarm system for a vehicle passenger seat belt comprising a drum, a belt engageable and lockable about a passenger, said belt having one end attached to and wound on said drum, locking means for preventing rotation of said drum after rotation of said drum a predetermined number of revolutions during belt unwind, said alarm system comprising an electrical alarm device and switching means for activating said alarm device, said switching means comprising a stationary switch contact, a movable switch contact and a switch operating means, said operating means comprising a member dis-

placeable by rotation of said drum and supporting said movable contact for holding said movable contact in engagement with said stationary contact to activate said alarm device until a predetermined number of revolutions of said drum have occurred, wherein said stationary contact is mounted on an insulating plate, said plate being adjustable manually in the direction of travel of said movable contact to position said stationary contact relatively to said movable contact to preset



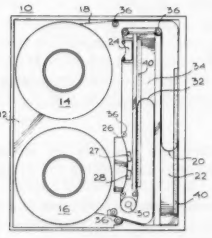
the duration of activation of said alarm device during belt unwind, and wherein said member displaceable by rotation of said drum is a nut member threaded on a threaded shaft driven in unison with said drum, said switch operating means further comprising means preventing said nut member from rotating such that rotation of said shaft causes longitudinal displacement of said nut member, said movable switch contact being mounted on said nut member.

3,866,855

TAPE TENSION AND VELOCITY CONTROL SYSTEM

Philip Stuart Bryer, Woodland Hills, Calif., assignor to Wangco Incorporated, Los Angeles, Calif.

Filed Oct. 24, 1972, Ser. No. 299,719
Int. Cl. B65h *17/02*
U.S. Cl. 242—184 **19 Claims**



1. Apparatus for controlling a web member such as a magnetic tape comprising:

pickup and supply reels for said tape;

means for guiding said tape along a predetermined path including a tape head from one to the other of said reels; tape drive means for frictionally engaging the tape to drive it along the path;

reel drive means for driving said reels;

at least one main vacuum chamber for developing at least one buffering loop in said tape along said path;

means for developing a control signal proportional to the extent of the loop in said chamber, said means comprising a transducer responsive to a selected parameter which varies within limits as the length of the tape loop is varied and a wall portion of said chamber having a predetermined non-linear configuration selected to linearize the relationship between the selected parameter and the length of the tape loop;

means for controlling the reel drive means in response to said control signal; and

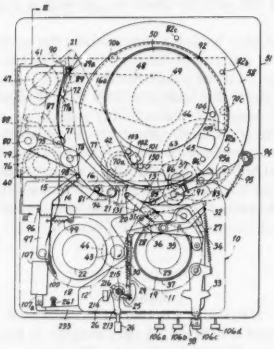
means defining a plenum chamber adjacent the vacuum chamber, the wall portion including means for controlling the pressure in the plenum chamber in accordance with the extent of the tape loop in the vacuum chamber.

3,866,856

AUTOMATIC TAPE LOADING TYPE, RECORDING AND/OR REPRODUCING APPARATUS

Hiroshi Katoh, Yokohama, Japan, assignor to Victor Company of Japan Ltd., Yokohama City, Kanagawa-ken, Japan

Filed Aug. 2, 1973, Ser. No. 384,939
Claims priority, application Japan, Aug. 3, 1972, 47-77813; Aug. 11, 1972, 47-79891
Int. Cl. B65h *59/38;* **G03b** *1/04;* **G11b** *1/52*
U.S. Cl. 242—188 **8 Claims**



1. An automatic-tape-loading type, recording and/or reproducing apparatus comprising:

loading means for drawing out a tape-form recording medium from a tape storing housing structure and loading the recording medium in a specific tape path outside of the housing structure;

means for accomplishing recording/reproducing of signals on/from the recording medium traveling along the specific tape path; and

means for returning the recording medium on the specific tape path into the tape storing housing structure,

said means for returning the recording medium comprisng a take-up reel for driving a take-up reel within the tape storing housing structure;

a driving roller for driving in rotation said reel disc,

first locking means for locking the driving roller in its pressed state for driving against the take-up reel disc in relation to the control manipulation placing the apparatus in the recording/reproducing mode and for unlocking the driving roller in relation to the changeover of the operation to the stop mode, and

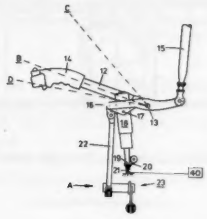
second locking means operated at the time of drawing out of the recording medium from the tape storing housing structure to lock the driving roller in its pressed state for driving against the reel disc and unlocking the driving roller when all of the recording medium outside of the storing housing structure has been returned thereinto,

said driving roller being held in pressed state against the reel disc by the second locking means still in locking state thereby to continue to drive the reel disc in rotation even though the driving roller is unlocked by the first locking means at the time of control of the operation to the stop mode.

3,866,857
HELICOPTERS

Tadeusz Leopold Ciastula, Yeovil, England, assignor to Westland Aircraft Limited, Yeouil, Somerset, England

Filed June 18, 1973, Ser. No. 370,779
Claims priority, application Great Britain, June 29, 1972, 30477/72
Int. Cl. B64c *27/76*
U.S. Cl. 244—17.25 **8 Claims**

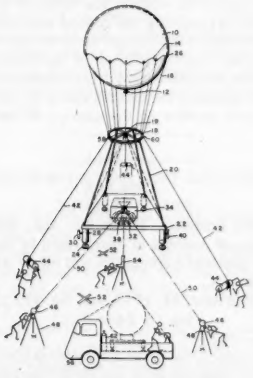


1. A helicopter having:
a main rotor system with a plurality of rotor blades,
a control system including a collective pitch control means for changing the pitch angle of each rotor blade by an equal amount,
said control means including a control lever operable in a generally vertical plane between opposed minimum and maximum stops which establish, respectively, minimum and maximum ends of a range of flying collective pitch angle settings,
said minimum stop including means for concurrently forming said minimum stop and also permitting that minimum stop position to be overrun by movement of the said lever beyond said minimum stop position to a negative collective pitch angle setting of the rotor blades, and wherein the extent of the said overrun is variable.

3,866,858
AERIAL PHOTOGRAPHIC MAPPING APPARATUS

John E. Rattenberry, Burnaby, British Columbia, Canada, assignor to Raymond Lee Organization, Inc,, New York, N.Y., a part interest

Filed Aug. 8, 1973, Ser. No. 386,525
Int. Cl. B64b *1/48*
U.S. Cl. 244—32 **2 Claims**

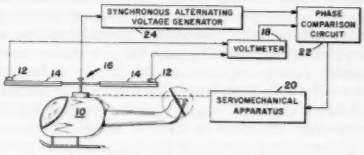


1. Apparatus used in aerial photographic mapping comprising:
an inflatable balloon;
parachute means enveloping the balloon to control the rate of fall of an elevated balloon when same is ruptured, allowing its use in populated areas at low heights;
a horizontal camera carrying platform having a central hole extending therethrough;
a camera disposed on the platform and having a downwardly disposed lens aligned with said hole;
a ring disposed horizontally below the balloon and above the platform;
first shroud means securing the ring to the parachute;
second shroud means securing the platform to the ring;
a plurality of concentric rings on the bottom of the platform centered on the hole and defining a target;
four shock absorbers;
four flexible foot pads, each pad being secured through a corresponding absorber to the bottom of a corresponding corner of the platform; and
battery powered warning lamps secured to said absorbers.

3,866,859
METHOD AND APPARATUS FOR DEFINING AN EQUIPOTENTIAL PLANE IN THE ELECTROSTATIC FIELD IN THE ATMOSPHERE UTILIZING ROTATING POTENTIAL SENSING PROBES

Maynard L. Hill, Silver Spring, Md.

Filed Nov. 16, 1973, Ser. No. 416,661
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 R **12 Claims**



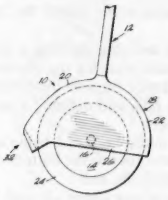
1. Apparatus for detecting the attitude relative to a reference plane of an airborne vehicle operating in the electrostatic field existing in the earth's atmosphere, comprising:
probe means mounted on said vehicle and responsive to the magnitude of said electrostatic field;
means for rotating the probe means in a given plane; and, means connected to said probe means for producing an output signal having an amplitude proportional to the angular attitude of the given plane, relative to the reference plane, in which the probe means are rotated and a phase related to the azimuthal direction of maximum tilt of the given plane, said output signal indicating the degree of alignment between said plane and the reference plane, the reference plane comprising an equipotential plane existing in the earth's electrostatic field.

12. A method for stabilizing an airborne vehicle operating in the electrostatic field existing in the earth's atmosphere relative to a reference plane, comprising the steps of:
rotating at least one sensing probe responsive to the electrostatic field in a given plane;
generating an output signal having an amplitude proportional to the angular attitude of the given plane, relative to the reference plane, in which the probe is rotated and a phase related to the azimuthal direction of maximum tilt of the given plane; and,
angularly displacing the position of the plane in which the probe is rotating to align with the reference plane, said reference plane comprising an equipotential plane existing in the electrostatic field.

3,866,860
AIRPLANE WHEEL ROTATOR

John M. Opitz, Sr., 2641 Aqueduct Rd., Schenectady, N.Y. 12309

Filed Sept. 24, 1973, Ser. No. 400,068
Int. Cl. B64c *25/40*
U.S. Cl. 244—103 S 5 Claims



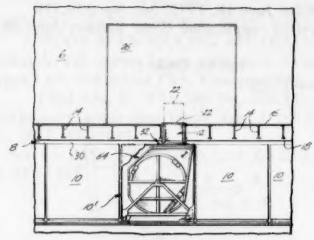
1. An airplane wheel rotating device for the landing gear mechanism of an aircraft having a rotatable wheel and tire comprising, an air stream deflecting fairing in covering relation with respect to a major portion of the wheel and tire and exposing less than a 50 percent portion of the circumference of the tire and wheel to the air stream when the airplane landing gear is in landing position, the air stream deflecting fairing having a forward portion aligned vertically with the axis of the wheel, the upper and side portions of the air stream deflecting fairing rearwardly of the forward portion being contoured to deflect the air stream away from the wheel and tire, the lower portion of the air stream deflecting fairing rearwardly of the forward portion being contoured in front of the tire and wheel and extending downwardly at an angle to terminate substantially beneath the centerline through the forward portion of the fairing and the axis of the wheel and terminating closely adjacent to the tire to deflect the air stream downwardly from the forward portion of the fairing to induce the air stream to impinge on the tire in a downwardly and rearwardly direction to exert a rotative component of force on the central portion of the tire and wheel to rotate it in the direction of flight of the air craft when the wheel assembly is in the airplane landing position, the lower portion of the air stream deflecting fairing along the sides of the tire and wheel beneath the centerline through the forward portion of the fairing and the axle being contoured to terminate closely adjacent to the side walls of the tire and wheel to deflect the air stream away from the side walls of the tire and wheel whereby the air stream flowing over the exposed lower portions of the tire and wheel exerts a turning force on the tire and wheel to rotate it in the direction of the flight preparatory to the landing of the aircraft.

3,866,861
FIRE-SAFE AIRCRAFT REFUSE DISPOSAL SYSTEM

Ronald R. Ratcliff; John F. Watts, and Alden D. Simonson, all of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 22, 1974, Ser. No. 462,719
Int. Cl. B64d *11/00*
U.S. Cl. 244—118 P 21 Claims

20. In an aircraft fuselage, a passenger deck having a hold therebelow and a chute therein through which refuse is fed to the hold, said hold having spaced surfaces and said chute opening into the hold at one of the surfaces, a refuse container removably insertable in the space between the surfaces and having an aperture therein that substantially registers with the opening of the chute, gasket means that is operatively interengaged between the container and the one surface about the chute, the gasket means being displaceable in relation to the one surface, and yieldable biasing means that is responsively connected with the gasket means so that the gasket means forms a compression seal between the container and the chute under the bias thereof, to the effect that the refuse in the chute

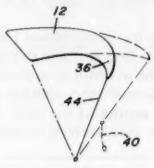


is fed to the container through a passage which is closed to the hold.

3,866,862
RISER CONTROLS FOR GLIDING PARACHUTES

Stephen L. Snyder, 331 Cherry Hill Blvd., Cherry Hill, N.J. 08034

Division of Ser. No. 244,034, April 14, 1972, Pat. No. 3,829,045. This application Apr. 5, 1973, Ser. No. 348,058
Int. Cl. B64d *17/34*
U.S. Cl. 244—152 6 Claims



3. In combination with a gliding parachute having a canopy with a continuous curvature when fully inflated, a plurality of suspension lines connected to the canopy and a payload harness connected to said suspension lines, brake control means operative on a portion of the canopy before complete deployment of the parachute, comprising at least one control line connected to said portion of the canopy, distortion control means connected to the control line between the canopy and the harness for maintaining the control line under tension to distort said portion of the canopy from the continuous curvature and thereby restrict inflation of the canopy during deployment of the parachute, and means connected to the control means for releasing the control line to permit unrestricted inflation of said portion of the canopy to said continuous curvature.

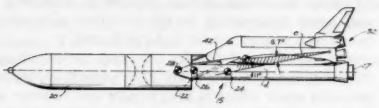
3,866,863
SPACE VEHICLE

George L. von Pragenau, Huntsville, Ala., assignor to The United States of America as represented by the Administration of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 21, 1974, Ser. No. 453,232
Int. Cl. B64c *39/02*
U.S. Cl. 244—162 6 Claims

1. A space vehicle having an improved ascent configuration adapted to be launched from the earth's surface comprising: A. an orbiter having re-entry capabilities including an elongated fuselage and a rearwardly directed liquid rocket engine fixed to said fuselage;

B. an external tank of an elongated configuration disposed forwardly of said fuselage and connected with said rocket engine for supplying thereto liquid propellants;



C. an expendable booster stage for propelling said vehicle including a pair of solid rocket boosters disposed beneath said fuselage and extended in substantial parallelism therewith; and

D. connecting means for releasably connecting said external tank and said booster stage with said orbiter.

3,866,864

MOUNTING ARRANGEMENT

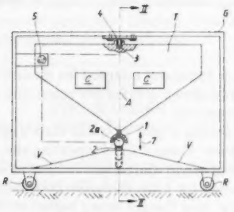
Christian Gotze, Munchen, and Friedrich Hujer, Grunwald, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 20, 1973, Ser. No. 399,059

Claims priority, application Germany, Sept. 22, 1972, 2246523

Int. Cl. A47g *29/00*

U.S. Cl. 248—1 **11 Claims**



1. In a photographic roll copier having a plurality of components whose relative orientation is to be fixedly maintained, an improvement in a mounting arrangement for said components comprising a frame which is subject to flexural deformation under the influence of external forces; a substantially rigid carrier for mounting said components in said relative orientation; and journalling means journalling said carrier in said frame with freedom of pivotable displacement relative thereto so as to prevent the transmission of stresses from said frame to said components.

3,866,865

SYSTEM FOR SUPPORTING AND ALIGNING DRIVE MOTORS

Jerald V. Dunlap, Pacific Palisades, Calif., assignor to Intercompressor, Inc., Santa Monica, Calif.

Division of Ser. No. 245,319, April 19, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,964

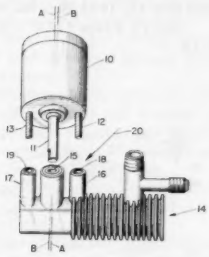
Int. Cl. F16c *35/00*; **F04b** *17/02*; **F16p** *15/06*

U.S. Cl. 248—2 **4 Claims**

1. In a driving motor having a housing and a rotatable driving shaft supported in said housing coupled to a driven device having a housing including a bearing for receiving said shaft, means for supporting said driving motor housing to said driven device housing and maintaining alignment of said shaft in said bearing for rotation about a common axis of the shaft and bearing, comprising:

a. at least two projections rigidly secured to and extending from one of said housings in radially spaced relationship to said common axis;

b. means in said other housing defining at least two projection receiving bores of greater cross-sectional area than said projections and radially spaced from said axis at



positions receiving said projections when said shaft and bearing are in substantial alignment; and

c. means rigidly securing said projections in said bores after an exact alignment of said shaft with said bearing has been effected so that said exact alignment is maintained permanently.

3,866,866

COLLAPSIBLE FITTING

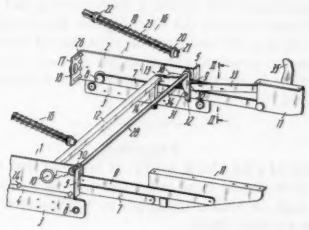
Karl Kneile, Holzmaden/Teck, Germany, assignor to Robert Krause KG Zweiniederlassung Weilheim/Teck, Weilheim/-Teck, Germany

Filed Dec. 14, 1973, Ser. No. 424,760

Claims priority, application Germany, Dec. 16, 1972, 2261733

Int. Cl. F16m *13/00*

U.S. Cl. 248—16 **15 Claims**



1. A fitting adapted for connection to an article of furniture, especially for supporting a machine such as a typewriter or the like therein for movement between extended working and retracted storage positions on the article of furniture, said fitting comprising; two laterally spaced parallelogram bar systems each comprising a bracket member, a connecting flange on each said bracket member for connection thereof to the article of furniture, a pair of parallel links pivotally connected at one end to each bracket member, a support platform pivotally supported on the other ends of said links and adapted for supporting a machine such as a typewriter, at least one said connecting flange being offset relative to the respective bracket member in a direction away from the other bracket member, arresting means operatively disposed between at least one bracket member and said links for retaining said platform in extended working position, said links extending outwardly from one end of said bracket members when supporting said platform in working position and extending downwardly from said bracket members when supporting said platform in storage position, and means connecting corre-

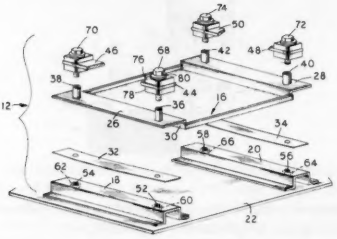
sponding links of said pairs of links to cause the links to pivot on said bracket members in synchronism.

3,866,867

MOUNT FOR AIR CONDITIONER COMPONENTS

Martin LaRocca, Staten Island, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,362
Int. Cl. F16m *11/04, 3/00*
U.S. Cl. 248—23 **4 Claims**



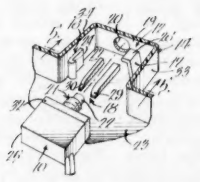
1. Means for supporting a compressor, motor, motor-compressor, or other unit of an air conditioner in an air conditioner housing, said means comprising parallel guide rails affixed to the housing, a mounting pad for said unit including a pair of flanges supported on the rails and depending structure between the flanges to engage inside surfaces of the guide rails whereby movement of the mounting pad is restricted to directions parallel to the directions in which the guide rails extend, a slide between each rail and associated flange of the mounting pad permitting the mounting pad to be easily moved on the rails, a plurality of sleeves on the mounting pad, removable fastening elements extendable through the unit, sleeves, slides and rails for defining a retracted position for the mounting pad and unit in said housing, means engageable with said fastening elements for securing the mounting pad and unit in said retracted position but disengagable therefrom to permit the mouting pad and unit thereon to be moved outwardly from said retracted position, and cushions on each of said sleeves compressible by the fastening elements for resiliently supporting the unit.

3,866,868

VACUUM CLEANER SWITCH MOUNTING MEANS

Warren Fish, White Bear Lake, and Arman Sundquist, Saint Paul, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 16, 1974, Ser. No. 433,915
Int. Cl. F16m *13/00*
U.S. Cl. 248—27 **14 Claims**



1. In an electrical appliance having a portion defining a wall, means for mounting an electrical control switch to said wall for selective manipulation of the switch, comprising:

a catch carried on said wall defining a forwardly facing latching shoulder;

resiliently deflectible presser means carried on said wall spaced from said catch for receiving said switch in a switch receiving space therebetween and resiliently urging the switch into retained association with said catch;

retainer means carried by said presser means for yieldably retaining the switch against movement outwardly from said space transversely to the direction of spacing between said presser means and catch; and

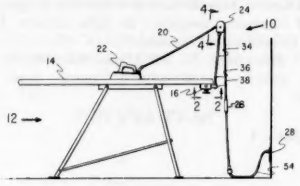
means carried by said wall for camming the switch against the retainer means as a result of movement of said switch into said space whereby said presser and retainer means further yieldably retain said switch against said cam means.

3,866,869

CORD RETRACTOR FOR ELECTRIC IRON

Carroll E. Woods, 4636 S.E. Fieldcrest Ave., Milwaukee, Oreg. 97206

Filed Oct. 9, 1973, Ser. No. 404,175
Int. Cl. F16l *3/00*
U.S. Cl. 248—51 **7 Claims**



1. A retractor apparatus adapted for mounting on an ironing board supported above a floor for retracting an electric iron cord which comprises:

a. a pulley having a pair of outer rims disposed on the respective sides thereof for supporting the cord;

b. a pair of outwardly-flared side flanges adjacent either side of said pulley for preventing the cord from slipping off of said pulley, said flanges being higher than the respective outer rims of said pulley and defining an open-topped slot-like receptacle for placement of the iron cord, the space directly above said pulley being free of any member attached to said retractor apparatus;

c. an elongate arm adapted to be mounted in an upright position on said ironing board having means at its top for supporting said pulley a distance above the ironing surface of said ironing board so as to prevent the cord from contacting the ironing surface, and having an elongate square member at its bottom extending generally at a right angle therefrom;

d. means adapted to be attached to the cord at a location between said pulley and the floor for weighting the cord;

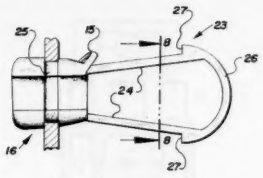
e. a clamp adapted to be attached solely to the underside of said ironing surface for detachably holding said arm selectively either in said upright position or in a second position parallel to and on the underside of said ironing surface, said clamp comprising means defining two elongate square apertures intersecting one another at right angles adapted to slidably accept said elongate square member and a threaded rod with a manual turning knob attached to one end thereof screwed into said clamp mechanism so as to communicate with the intersection of said apertures and adapted to be tightened against said elongate square member when said member is inserted in either of said apertures, for permitting said arm to be changed from one of said positions to the other solely by the detachment and re-attachment of said arm to said clamp; and

f. means for attaching said clamp to the underside of said ironing surface.

3,866,870
CORD ANCHORAGE SECURING DEVICE AND SECURE CORD ANCHORAGE

John H. Nicholson, Perndowne, England, and William Jemison, Summit, N.J., assignors to Heyman Manufacturing Company, Kenilworth, N.J.

Division of Ser. No. 223,203, Feb. 3, 1972, Pat. No. 3,779,494.
This application Aug. 13, 1973, Ser. No. 387,677
Int. Cl. F16l *5/00*
U.S. Cl. 248—56 **2 Claims**

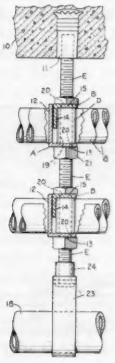


1. In combination an appliance securing device for securing an electric cord anchorage device to a body having an aperture adapted to receive said electric cord anchorage device, and an electric cord anchorage device, said electric cord anchorage device comprising at least a grip block and a shank, said appliance securing device having a resilient arm portion and at least two integral stem portions, said at least two stem portions extending from a point inward of the ends of said resilient arm portions spaced apart a distance greater than the width of said aperture, and said electric cord anchorage device being integral to said stem portions.

3,866,871
PIPE HANGER

Robert S. Dupuy, Sr., 2909 Tournefort St., Chalmette, La. 70043

Filed Jan. 31, 1973, Ser. No. 328,266
Int. Cl. F16l *3/22*
U.S. Cl. 248—59 **1 Claim**



1. A pipe hanger comprising:

A. a pair of elongated aligned opposed L-shaped elements each having a leg and a web at substantially a right angle to said leg;

B. a plurality of spaced pipe receiving portions carried in each leg;

C. said pipe receiving portions of one leg being in alignment with complementary pipe receiving portions of the other leg in opposed pipe receiving relation thereto with said legs overlapping in gripping engagement with said pipes;

D. a single spacer having a longitudinal opening therein positioned between opposed webs;

E. each of said webs having an opening therein aligned with said longitudinal opening in said spacer;

F. an elongated threaded hanger passing through said opening in each of said webs and through said longitudinal opening in said spacer;

G. a threaded fastening means threadably carried on said elongated hanger on each side of said opposed webs retaining said opposed elements and spacer for exerting a gripping force on said pipes and for adjustably mounting on said hanger as a unitary assembly;

I. said spacer is positioned centrally of said elongated elements with complementary pipe receiving portions carried on each side thereof; and

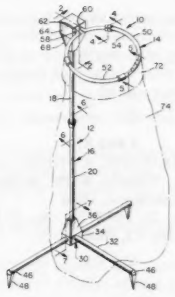
J. a second pair of such elongated aligned opposed elements with an additional such spacer adjustably mounted upon said hanger with threaded fastening means on each side thereof;

whereby a plurality of spaced pipes may be received and retained in respective pipe receiving portions and carried upon a single hanger.

3,866,872
BAG HOLDER

Lloyd Eugene Burgess, 737 E. Third St., Flora, Ill. 62839

Filed July 6, 1973, Ser. No. 377,054
Int. Cl. B65b *67/12*
U.S. Cl. 248—97 **3 Claims**



1. A bag holder comprising a base block having a body portion provided with a vertical bore, said body portion having a front face and opposing side faces disposed angularly to the front face, each of said faces being provided with a horizontal bore, horizontally disposed rod elements having inner ends frictionally fitted in the horizontal bores and having outer ends provided with ground engaging feet, said rod elements defining stabilizing legs and being angularly spaced apart in their horizontal extension from the front and side faces of the base block with legs being coplanar and supporting the base block, a vertically disposed standard having a lower end portion frictionally fitted in the vertical bore of the base block, a head block having a body portion provided with a vertical bore, said standard having an upper end portion frictionally fitted in the vertical bore in the head block whereby the head block is supported in a position overlying and spaced above the base block, said head block having a front face provided with a pair of horizontal bores, a circular split ring having an open inner end defined by offset fingers that are frictionally

fitted in the horizontal bores of the head block so that the ring projects horizontally from the upper end of the standard in a manner to substantially overlie the legs, tubular spring clips disposed on the ring for attaching the edges of the open end of a bag therewith, said clips being split lengthwise and being slidable on the ring, said ring being tubular and having split outer ends and a plug frictionally fitted in such outer ends to detachably secure them together in abutting relation.

3,866,873

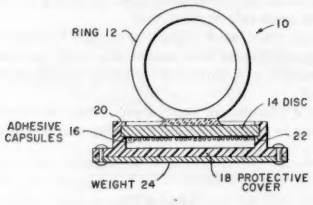
ADHESIVE-FASTENED PADEYE DEVICE

William H. Bohli, Catonsville, Md., assignor to The United States of America, as represented by the Secretary of the Navy, Washington, D.C.

Filed June 16, 1972, Ser. No. 266,523

Int. Cl. A47b *93/10*

U.S. Cl. 248—205 A **6 Claims**



1. A padeye attachment assembly adapted to be secured to a surface comprising:

a supporting plate;

an annular handle affixed to one side of said plate for manipulating said assembly and for support and atttachment of other devices;

a plurality of adhesive-containing, frangible microcapsules attached to the other side of said plate; and

a shallow, cup-shaped protective cover adapted to engage the edge of said plate and spaced therefrom to cover and protect said microcapsules.

3,866,874

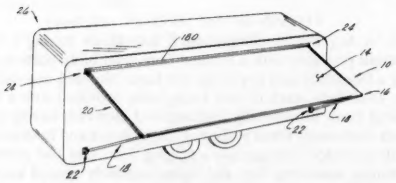
BRACKET FOR MOUNTING AWNINGS AND THE LIKE

Albert E. Upton, Jr., Wichita, Kans., assignor to Scott and Fetzer Company, Lakewood, Ohio

Filed Mar. 26, 1973, Ser. No. 344,903

Int. Cl. E04f *10/06*

U.S. Cl. 248—251 **4 Claims**



1. Bracket means for mounting and supporting retractable awnings on a supporting surface comprising:

a. a portion of said bracket means having means for mounting said bracket means on said supporting surface,

b. another portion of said bracket means having means for mounting a rigid support member, and

c. said means for mounting a support member having an aperture therethrough constructed and adapted to receive and hold a pin or the like,

d. said bracket member having on a normally upper surface thereof a notched portion formed by an inclined portion and an upright portion.

3,866,875

METHOD AND APPARATUS FOR SUPPORT OF SHEET MATERIAL

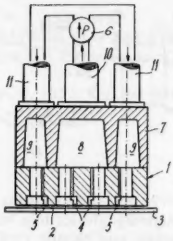
Yves Fournier, Chalon Sur Saone, France, assignor to Saint-Gobain Industries, Neuilly sur Seine, France

Filed Feb. 6, 1973, Ser. No. 330,103

Claims priority, application France, Feb. 10, 1972, 72.04433

Int. Cl. F16m *13/00*

U.S. Cl. 248—363 **4 Claims**



1. Apparatus for the support of sheet material from above against the force of gravity, said apparatus comprising a plate having a plurality of exhaust ports therethrough for the aspirated exhaust of gas from beneath said plate and having a plurality of inlet ports therethrough for supply of gas through the plate to the space below it, said inlet ports being disposed at least in part on opposite sides of said exhaust ports, a stopper partly obturating each of said ports, the stoppers in the inlet ports being of a different size from those in the outlet ports means to maintain a sub-ambient pressure at said exhaust ports and means to maintain a supra-ambient pressure at said inlet ports.

3,866,876

SEAT SLIDE MECHANISM

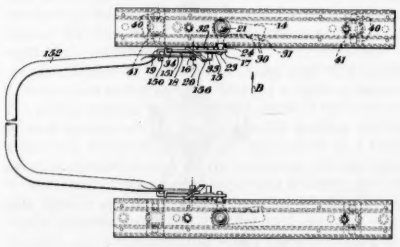
Albert John Adams, Fetcham, England, assignor to A. W. Chapman Limited, London, England

Filed May 20, 1974, Ser. No. 471,333

Claims priority, application Great Britain, May 29, 1973, 25533/73

Int. Cl. F16m *11/20;* **F16c** *29/00;* **A62b** *35/00*

U.S. Cl. 248—429 **8 Claims**



1. A seat slide mechanism including a slide and a rail, a rack on said rail, a catch lever pivotally mounted on said slide, spring means influencing said catch lever into engagement with said rack to lock the slide and the rail to one another, an operating member pivotally mounted on said slide and having two ends, one of said ends being connected to said catch lever,

whereby angular movement of the other of said ends of said operating member about the horizonatal pivotal axis of said operaing member causes the catch lever to move angularly about its vertical pivotal axis against the influence of said spring means out of engagement with said rack.

3,866,877

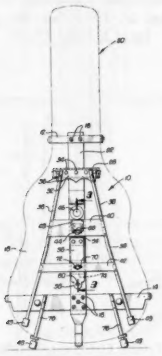
STAND DEVICE FOR MUSICAL INSTRUMENT CASE

Ira G. Thompson, 4033 Bell Ave., No. 7, Bell, Calif. 90201

Filed May 31, 1974, Ser. No. 474,892

Int. Cl. A47g *29/00*

U.S. Cl. 248—359 **2 Claims**



1. A stand device for a musical instrument case comprising: a support means rigidly mounted to said case and having a securing block mounted thereon;

a top hinge means secured to said support means by one leaf of said hinge means and having leg support means secured to the other leaf of said hinge, said leg support means being provided with an upper crossbar member and a lower crossbar member, said upper crossbar member having a latch block means and a slot and said lower crossbar member having an opening in its middle portion; a bottom hinge means having a latching means for securing said stand device in an open position and in a closed position, said latching means including a tongue member having its inner end hingedly secured to said support means and its outer end formed with a slot therein and its middle portion having an opening therein formed to fit around said securing block of said support means;

a latch key means having its bit portion retained in said latch block means of said upper crossbar member and having said lower end formed to fit into said slot of said tongue member; and

flange retaining means mounted on said support means above said tongue member and having a slot formed in its upper portion to receive said tip of said lower end of said latch key when said stand device is in a closed position.

3,866,878

UNITARY LOCK NUT ASSEMBLY

Albert K. Yamamoto, Huntington Beach, Calif., assignor to Tridair Industries, Redondo Beach, Calif.

Filed June 8, 1973, Ser. No. 368,426

Int. Cl. B65d *45/24*

U.S. Cl. 248—500 **2 Claims**

1. A unitary lock nut assembly for securing a member comprising in combination

A. A threaded bolt having a keyway substantially along its length and attachment means at one end for attachment to a supporting member,

B. A nut threadably engaged with said bolt and having

a. an annular shoulder with a cam surface thereon,

b. a reduced diameter portion rearwardly of said shoulder, and

c. a series of ratchet teeth along its rearward end face,

C. A substantially cylindrical follower in nonrotatable but slidable engagement with said bolt rearwardly of said nut, said follower having

a. a key within the keyway of said bolt,

b. an increased diameter section forming an annular stop shoulder along its forward end face, and

c. a plurality of ratchet teeth on its forward end face adapted for engagement with the ratchet teeth of said nut,

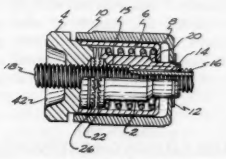
D. A cup-shaped spring retainer carried over said follower,

a. said retainer having an opening at its closed end,

b. said rearward end of said follower extending through the opening of said retainer, and

c. the open end of said cup-shaped retainer secured to the reduced diameter portion of said nut,

E. A cup-shaped drive knob carried over said spring retainer,



a. said drive knob having an opening at its closed rearward end,

b. said rearward end of said follower extending through said drive knob opening,

c. said drive knob having a cam surface at its forward end for caming engagement with said cam surface on said nut,

d. said drive knob having a knurled outer surface to facilitate manual gripping, and

e. said drive knob rotatable with respect to said nut and said bolt,

F. A retaining means for retaining said drive knob on said follower,

G. A spring bearing against the shoulder of said follower and the closed end portion of said spring retainer biasing said ratchet teeth of said follower and the ratchet teeth of said nut into ratchet engagement and biasing said cam surface on said drive knob and said cam surface on said nut into caming engagement, and

H. said cam surfaces arranged with respect to said ratchet teeth whereby said ratchet teeth are engaged and disengaged by said cam surfaces when said drive knob is rotated relative to said nut.

3,866,879

WATER LEAK VALVE

David Villarreal Elizondo, Calle Sor Juana Ines de la Cruz No. 323; Armando Reyna Rendon, Calle Rio Balsas No. 411 Sur, and Patrick W. MacKay Murphy, Calle Martin de Zavala No. 760 Sur, Apt. 106, all of Monterrey, N.L., Mexico

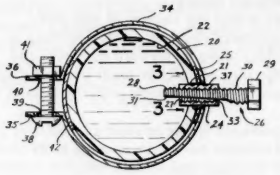
Filed Mar. 13, 1972, Ser. No. 233,978

Int. Cl. F16k *51/00*

U.S. Cl. 251—145 **1 Claim**

1. In a surface irrigation system consisting of at least one pipe including a longitudinally extending bore and at least one communicating and radially extending bore, a water leak

valve comprising a member including a longitudinally extending bore terminating at opposing ends in first and second openings with at least the portion of said bore adjacent said second opening provided with internal threads, an outwardly extending flange on said member, said member inserted in said radially extending bore in said pipe until stopped by said flange, said first opening in said member communicating with said longitudinally extending bore in said pipe, said member secured in said pipe by transversely extending means at least



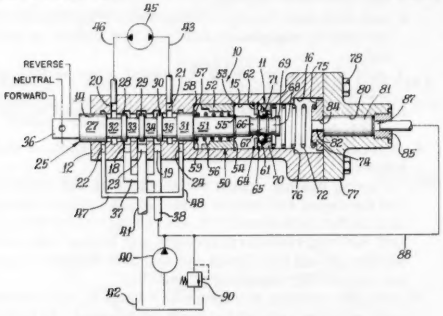
partially passed around said pipe and at least partially passed around said flange, a valve comprising first and second sections of external threads, said first section comprising at least two complete helices, said second section comprising a longitudinally extending and angularly inclined flat with not less than one half of each of said external threads removed at any transverse plane along the length of said second section whereby adjustment of said valve provides an opening between said flat of said valve and said second opening in said member through which liquid may be metered.

3,866,880

VALVE ASSEMBLY HAVING A PRESSURE RESPONSIVE DETENT MECHANISM

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Calif.

Filed Oct. 9, 1973, Ser. No. 404,213
Int. Cl. F16k *11/02, 31/143*
U.S. Cl. 251—297 **7 Claims**



1. A hydraulic valve assembly comprising:

a valve body having a cylindrical bore and fluid inlet and outlet openings communicating with said bore;

a spool reciprocably disposed in said bore and movable to at least a first operating position to effect communication between said inlet and outlet openings, and to a neutral position to block said communication;

centering spring means for biasing said spool to said neutral position; and

pressure responsive detent means disposed in said valve body and responsive to a predetermined operating fluid pressure to hold said spool in said operating position against the force of said centering spring, and operative in response to a drop in said fluid pressure below said predetermined pressure to release said spool for movement by said centering spring to neutral position,

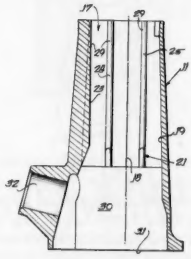
said detent means comprising a plurality of annular grooves extending around the outer diameter of said spool, a plurality of balls mounted in said valve body surrounding said spool for engagement with said grooves, reciprocal annular camming means extending around said spool externally thereof for engaging and biasing said balls into said grooves, and piston means mounted in said housing and responsive to fluid pressure for biasing said annular camming means into camming engagement with said balls, including resilient means connecting said piston to said annular camming means.

3,866,881

JACK HOUSING

Richard S. Graafsma, Benton Harbor, Mich., assignor to Auto Specialties Manufacturing Company, St. Joseph, Mich.

Filed Aug. 24, 1973, Ser. No. 391,237
Int. Cl. B66f *13/00*
U.S. Cl. 254—1 **5 Claims**



1. A die cast jack stand casting having an elongated axially tapered hollow formed therein defined by a tapered interior wall and open at the divergent end, and guide means for guiding a jack member for extensible and retractible motion relative to the casting, said guide means including a plurality of narrow, inwardly and longitudinally extending ribs integral with and spaced around said interior wall, said ribs presenting jack member engaging guide surfaces diverging from said interior wall and substantially parallel to each other and to the longitudinal axis of said casting, said tapered interior wall being formed for permitting removal of the casting from a die while still presenting said substantially parallel surfaces.

3,866,882

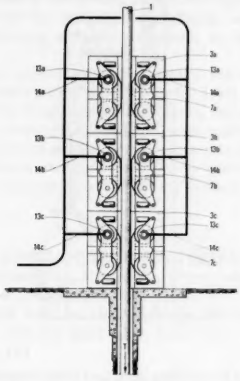
DEVICE FOR CONTINUOUSLY PULLING AN ELONGATED MEMBER

Yves Willm, Suresnes; Jean Thiery, Le Pecq; Michel Chatard, Chatou, and Pierre Grolet, Orgerus, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed May 22, 1973, Ser. No. 362,739
Claims priority, application France, May 30, 1972, 72.19408
Int. Cl. E21b *19/00*
U.S. Cl. 254—29 R **4 Claims**

1. A device for continuously pulling an elongated member, comprising frame means provided with a passageway for the elongated member, said passageway having an axis, a series of pulling means carried by said frame means and arranged along said axis, each of the pulling means comprising at least two endless pulling devices carrying gripping pads, guide means provided in said frame means for each endless pulling device, each endless pulling device being provided with hydraulic jack means releasably connected to said endless pulling device and carried by said frame means, said hydraulic jack means being provided for reversibly displacing said endless pulling device from a position spaced from said axis to a gripping position

closer to said axis, first hydraulic pipe means connected to each of said jack means for applying hydraulic pressure thereto, and means for synchronizing said pulling devices including a plurality of hydraulic motors operatively connected to each of said pulling devices, respectively, and second hydraulic pipe means comprising supply pipes for connecting said hydraulic motors in parallel to a common source of pressurized hydraulic fluid.



3,866,883

APPARATUS FOR PARTING ADHERING BODIES

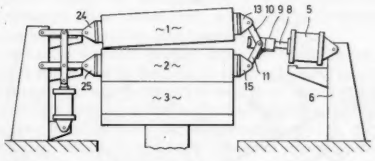
Rolf Erik Goransson, Akarp, Sweden, assignor to Internationella Siporex Aktiebolaget, Malmo, Sweden

Filed Dec. 11, 1973, Ser. No. 423,826

Claims priority, application Sweden, Dec. 21, 1972, 16833/72

Int. Cl. B66f *3/24*

U.S. Cl. 254—93 R **7 Claims**



1. An apparatus for forcing apart a pair of bodies which adhere to each other with substantially planar surfaces and both of which have two opposite and free side surfaces located in a pair of planes which, at least approximately, are parallel and at right angles to the adhering body surfaces, said apparatus comprising first jaw means operative to frictionally engage one side surface of one of the two bodies, second jaw means operative to frictionally engage the corresponding side surface of the other body, counterholding means operative to engage the opposite side surface of the two bodies, holder means connected to said first and second jaw means and common to them, actuator means for varying the distance between said holder means and said counterholding means and operatable to forcibly reduce the distance between said holder means and the bodies, and means movably connecting said holder means to each of said first and second jaw means in a manner to bring about forced spreading of said jaw means after their engagement with the two bodies, when the distance between said holder means and the bodies is reduced.

3,866,884

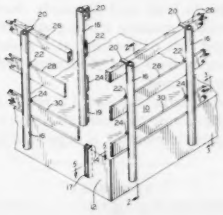
GUARDRAIL ARRANGEMENT AND METHOD OF INSTALLING

Roland Lee Heil, Wakarusa, and Albert John Mroczkiewicz, North Liberty, both of Ind., assignors to Miller Steel & Supply Company, Incorporated, Elkhart, Ind.

Filed Jan. 2, 1973, Ser. No. 320,459

Int. Cl. E04h *17/18*

U.S. Cl. 256—59 **9 Claims**



1. A safety guardrail, especially for use in buildings under construction to guard openings in the floor, comprising post means adapted to be supported substantially vertically adjacent the edge of the opening to be guarded, spaced bracket means on said post means adapted to receive and support horizontal rails therein, and cooperating elements of connecting means one disposed in the floor and the other forming a part of post means respectively and comprising a dove tail socket formed within the floor and forming a part thereof the floor adjacent said edge and a coacting means secured to one side of said post means and proportioned to be received in a vertical sense within said socket by upward and downward vertical movements and proportioned to prevent bending in any vertical plane out of such dove tail socket which reduces in dimension toward the outer edge of the floor to maintain said post means in a substantially vertical position adjacent said edge while providing for vertical insertion and removal relatively to said dove tail socket.

3,866,885

WORKING METHOD FOR HOMOGENIZING PARTICLE MATERIAL

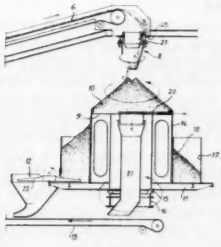
Arnold W. Gerstel, Woerden, and Karel G. L. Meyers, Zaandam, both of Netherlands, assignors to Litton Systems, Inc., Passaic, N.J.

Filed Oct. 25, 1972, Ser. No. 300,877

Claims priority, application Netherlands, Oct. 25, 1971, 7114653

Int. Cl. B01f *9/10*

U.S. Cl. 259—3 **6 Claims**



1. A working method for the homogenizing of particle material: comprsing

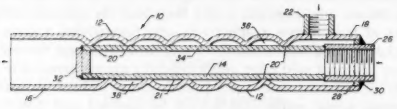
a. rotating a particle supply apparatus at a predetermined speed in a closed circuit and with a uniform motion about a predetermined axis of rotation;
b. providing particle material to and from said supply apparatus;
c. depositing said particle material layer by layer upon a catch plate or gutter of a circularly moving apparatus so as to form a ring-shaped pile having a first end rising up from said circularly moving apparatus at the natural slope angle formed by said particle material as it is deposited and a second end which rises up to a predetermined maximum height from said circularly moving apparatus;
d. moving said circularly moving apparatus about said predetermined axis of rotation at a speed considerably lower in velocity than said predetermined speed of said supply apparatus; and
e. reclaiming said particle material from said pile at a fixed position and at a rate approximately equal to the rate at which said particle material is deposited upon said pile.

3,866,886

SPIRAL TUBE MIXING DEVICE AND METHOD OF MAKING

John K. Thorne, Decatur, Ala., and Jay E. Sobel, Highland Park, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 2, 1973, Ser. No. 402,871
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **7 Claims**



1. A mixing device comprising a porous inner tube and an outer tube having an axially extending continuous spiral groove in contact with the outer surface of said porous tube, said porous inner tube having flow restriction means at one end and being open at the other end for receiving a pressurized supply of a first fluid to be pumped through the porous walls of said inner tube into said spiral groove under pressure, said outer tube being open at one end for receiving a second fluid, and being open at its other end for delivering a mixture and/or a reaction product of said first and second fluids.

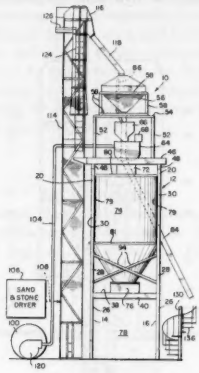
3,866,887

VERTICALLY INTEGRATED ASPHALT PLANT

Howard E. Potter, Bedford, Ind., assignor to Oolitic Ground Limestone Co., Inc., Bedford, Ind.

Filed Dec. 13, 1973, Ser. No. 424,446
Int. Cl. B28c *1/22*
U.S. Cl. 259—154 **8 Claims**

1. An asphalt plant comprising a main, vertically extending framework including a first support frame at a first elevation and a second support frame at a second and higher elevation, a heated and insulated storage hopper supported on said framework and extending generally between said first and second support frames, said hopper providing a loading gate approximately at the height of said first support frame, said first support frame being disposed at a height sufficient to accommodate conventional asphalt trucks thereunder to be loaded from said hopper, said hopper being of a size sufficient to contain several truck loads of heated asphalt mix, a mixing system mounted on said second support frame, said mixing system including means for mixing hot liquid asphalt with sand and stone, means for conveying such hot liquid asphalt upwardly to said mixing means, said mixing means being disposed to drop the hot mixed material downwardly into the upper end of said storage hopper, a weigh hopper disposed above said mixing means and arranged to deposit controlled amounts of sand and stone into said mixing means, a second



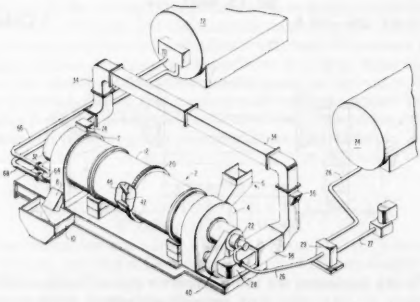
storage hopper for holding sand and stone disposed above said weigh hopper, and means for coveying sand and stone upwardly to said second hopper.

3,866,888

APPARATUS FOR MAKING HOT ASPHALT PAVING MATERIAL

Michael Dydzyk, Baltimore, Md., assignor to Thomas I. Baldwin; William E. Baldwin and Frank P. Scrivener, all of Millersville, Md., a part interest to each

Filed Jan. 26, 1973, Ser. No. 326,730
Int. Cl. B28c *1/22*
U.S. Cl. 259—158 **9 Claims**



1. Apparatus for making asphalt paving material from a particulate aggregate material and asphalt, comprising,
a rotary drum having an inlet end and an outlet end,
means for rotating the drum about its longitudinal axis,
said drum having a drying section extending inwardly from the inlet end thereof and a mixing section extending inwardly from the outlet end thereof,
burner means for directing a flame into the drying section,
means for lifting the aggregate material in the drying section and releasing the material so lifted downwardly through the area heated by the flame for removal of moisture,
a heat shield located within the drum in axial alignment with the flame,
said heat shield defining the downstream end of the drying section and the upstream end of the mixing section,

an opening in the plane of the shield permitting the flow of aggregate material from the drying section to the mixing section,

means in the mixing section for introducing hot asphalt into the aggregate material,

agitator means in the mixing section for agitating and mixing together the asphalt and aggregate material, means for withdrawing exhaust gases from the mixing section, and

recirculation means for returning the exhaust gases and airborne solid particles therein to the drying section at the inlet end of the rotary drum whereby the heat and combustible constitutents of the exhaust gases aid the combustion process in the drying section and the airborne solid particles are removed from the gases upon contact with the hot asphalt in the mixing section.

3,866,889

MOBILE CONVEYOR SYSTEM

Glenway W. Maxon, III, Milwaukee, Wis., assignor to Stowell Industries Inc., Milwaukee, Wis.

Filed Aug. 16, 1972, Ser. No. 281,230

Int. Cl. B28c *5/14, 5/42, 7/06*

U.S. Cl. 259—161 **5 Claims**

1. A mobile conveyor system for receiving and distributing a material including components of different weights, such as concrete, at a controllable rate comprising, in combination

a truck having a chassis;

an open-top surge hopper mounted on said chassis for receiving and temporarily holding a quantity of the material, said surge hopper having a capacity sufficient to accommodate surges in supply of the material in excess of the desired rate of distribution and to accommodate a reserve supply of the material so distribution can be continued when there is a temporary interruption of supply of material to said hopper;

an upwardly inclined supply conveyor mounted on said truck for delivering material to the front end of said surge hopper, said supply conveyor having an upper end and a receiving hopper at the lower end which is adapted to receive material from delivery vehicles;

a deflector mounted on the top portion of said surge hopper and positioned adjacent the upper end of said supply conveyor such that material being discharged from the upper end of said supply conveyor strikes said deflector before falling downwardly toward said surge hopper, said deflector serving to baffle the material so that heavier components do not separate therefrom while being discharged into said surge hopper;

a discharge opening in the rear portion of said surge hopper;

an agitator including blade means which imparts an auger action on material held in said surge hopper to move the material rearwardly towards said discharge opening;

means for controlling the rate of which the material is discharged through said discharge opening;

means for tilting said surge hopper about a transverse axis adjacent the rear of said surge hopper to facilitate discharge of the material through said discharge opening, said deflector being sufficiently spaced from the upper end of said supply conveyor to permit said surge hopper to be tilted without interference with said supply conveyor; and

means mounted on the rear of said truck for distributing the material discharged through said discharge opening.

3,866,890

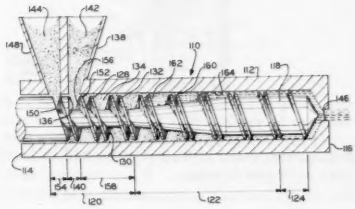
APPARATUS FOR SIMULTANEOUS PLASTICATING AND MIXING

Zehev Tadmor, Haifa, Israel, and Imrich Klein, Highland Park, N.J., assignors to Scientific Process & Research Inc., Highland Park, N.J.

Filed Nov. 13, 1973, Ser. No. 415,389

Int. Cl. B29b *1/04, 1/06*

U.S. Cl. 259—191 **18 Claims**



1. Apparatus for preparing a plasticated mixture from a basic material and at least one selected ingredient such that the ingredient is mixed throughout the plasticated mixture, said apparatus comprising:

a barrel extending axially between an upstream end and a downstream end;

a screw conveyor in the barrel;

a flight on the screw conveyor for conveying material axially downstream along the barrel, said flight having a leading face facing downstream and a trailing face facing upstream;

said flight defining a channel between the leading face and the trailing face, through which channel said material will pass as the material is conveyed downstream;

means for supplying the basic material to the channel;

means for supplying the ingredient to the channel separate from the basic material; and

means for confining the ingredient to a portion of the channel at least until the remainder of the channel is supplied with the basic material.

3,866,891

VACUUM FURNACE EQUIPMENT FOR HEAT TREATMENT, HARDENING AND BRAZING WORKING PARTS

Fritz Kalbfleisch, Lieblos, Germany, assignor to Deutsche Gold-und Scheideanstalt Vormals roessler, Frankfurt (Main), Germany

Filed Nov. 8, 1972, Ser. No. 304,632

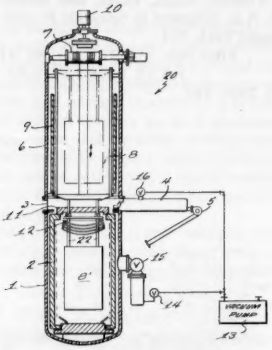
Claims priority, application Germany, Nov. 12, 1971, 2156306

Int. Cl. C21d *9/00*

U.S. Cl. 266—5 E **7 Claims**

1. In combination a vacuum furnace unit for heat treating, hardening and brazing of work pieces, a removable protective dome for said furnace, a vacuum slide valve operatively connected to said furnace, means in said dome for supporting the work pieces inside said dome, means in said dome for raising

and lowering said supported work pieces to position out of and in said furnace and separate treating means for receiving said



work pieces while external to, but supported by, said dome and while out of said furnace.

3,866,892

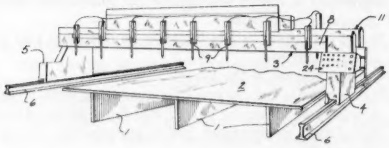
DUAL TORCH CUTTING APPARATUS

Harry Hooper, Brookfield, Wis., assignor to C-R-O Engineering Co., Inc., Brookfield, Wis.

Filed June 11, 1973, Ser. No. 368,498

Int. Cl. B23k *7/02*

U.S. Cl. 266—23 K **8 Claims**



1. A flame cutting apparatus for flame cutting of a workpiece supported in a work area, comprising a longitudinal carriage means mounted for longitudinal movement over a work area, a first bridge unit attached to said carriage means and extending across said work area, said first bridge unit including transverse carriage means to support a plurality of cutting torches for simultaneous transverse movement over the work area, a second bridge unit attached to said longitudinal carriage means in longitudinally spaced relation to said first bridge unit, said second bridge unit having a second transverse carriage means movably supporting a torch means for transverse movement over essentially the complete work area, and control means having a first position operably connected to said first transverse carriage means and a second position operably connected to said second transverse carriage means to transversely move one or the other carriage means and thereby provide alternate working capabilities of the apparatus.

3,866,893

APPARATUS FOR DESOLDERING SCRAP RADIATOR CORES AND RECOVERING SEPARATED METALS

Richard Hoberman, 1030 Hillcrest Dr., Omaha, Nebr. 68132

Filed Feb. 5, 1974, Ser. No. 439,743

Int. Cl. F27b *17/00*

U.S. Cl. 266—33 S **7 Claims**

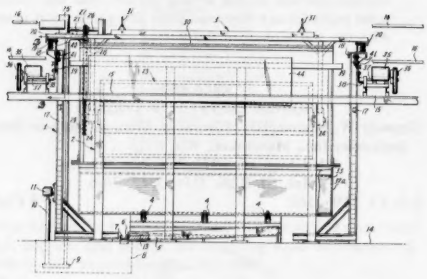
1. Apparatus for desoldering radiator cores comprising:

a. a fixed frame and tank support assembly;

b. a tank supported by said support assembly, said tank having a top opening and a bottom;

c. a fused heat transfer medium in said tank, the temperature of said medium being maintained by a suitable heating means at a temperature greater than the melting temperature of the solder to be separated from said radiator cores, but less than the melting temperature of said cores;

d. a basket assembly for supporting radiator cores to be desoldered in said heat transfer medium, said basket assembly comprising a perforated basket mounted for rotary motion about a longitudinal axis within said heat



transfer medium through said tank top opening, and supported with respect to said fixed frame and tank support assembly for reciprocating motion in a plane extending transversely of said longitudinal axis;

e. means for simultaneously rotating said basket about its longitudinal axis and causing its cyclic reciprocation in said transverse plane to impart intense agitation to radiator cores placed in said basket and to cause solder sweated out from said cores by said heat transfer medium to be separated from said cores; and

f. means for recovering separated solder from said tank bottom.

3,866,894

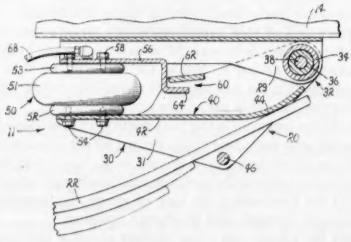
AIR SPRING UNIT FOR SUSPENSION SYSTEMS

Phillip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Fresno, Calif.

Filed Sept. 27, 1973, Ser. No. 401,241

Int. Cl. F16f *11/34*

U.S. Cl. 267—31 **1 Claim**

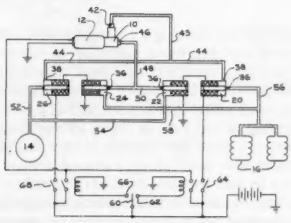


1. In combination with a suspension system for a vehicle of a type including a load-supporting axle and a leaf-spring assembly extended transversely of said axle and mounted thereon in a load-supporting relation with the frame of the vehicle, an improved air spring unit comprising:

A. means including a bracket suspended from said frame;

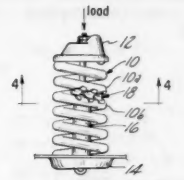
B. a force dissipating arm of an elongated configuration;
C. coupling means supporting said arm for pivotal motion in a vertical plane, including a horizontally extended pivot pin for pivotally connecting one end of said arm to said bracket in a coplanar relationship therewith;
D. a variably pressurized air bag interposed between said arm and said bracket and connected with said arm at the end thereof opposite said one end;
E. means for maintaining the height dimension of said air bag substantially constant, including an operable leveling valve connected with said air bag for varying the pressure within the air bag as predetermined pivotal motion in opposite directions is imparted to the force dissipating arm, and motion limiting means including a motion limiting stop for arresting pivotal motion of said force dissipating arm in at least one direction; and
F. means for causing the air bag to support said arm in a substantially uniform manner against rotation about said pivot pin through a moment arm of a substantially fixed length including a wear plate defined on said arm in juxtaposition with said one end of the arm and in spaced relation with the end thereof opposite said one end, said wear plate being continuously seated on said leaf-spring assembly with the juxtaposed surfaces of the wear plate and the leaf-spring assembly being mated in a slidable relationship.

3,866,895
SUSPENSION SYSTEM FOR VEHICLES
Forrest O. E. Schultz, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Oct. 1, 1973, Ser. No. 402,263
Int. Cl. B60q *11/30*
U.S. Cl. 267—65 D **11 Claims**



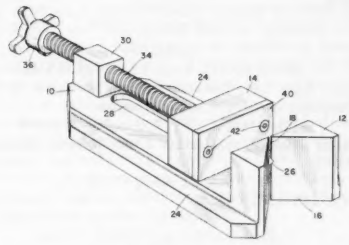
1. A vehicle suspension system comprising a fluid reservoir, a fluid pump, a variable volume fluid suspension unit between sprung and unsprung portions of a vehicle, conduit means interconnecting said suspension unit, reservoir and pump, control means interposed in said conduit means and being operable in response to a first signal to increase pressure and to a second signal to decrease pressure in said suspension unit, means for operating said pump in response to said first and second signals, said control means being initially responsive to said first signal to communicate said reservoir with said suspension unit to equalize pressures in said suspension unit and said reservior when the pressure in the latter is higher than in said suspension unit and said pump being operable thereafter to receive air from said reservoir and deliver air to said suspension unit until said first signal is terminated, said control means being initially responsive to said second signal to communicate said suspension unit with said reservoir independently of said pump to equalize pressures in said suspension unit and reservoir when the pressure in said suspension unit is higher than the pressure in said reservoir and said pump being operable thereafter to receive air from said suspension unit and deliver it to said reservoir until said second signal is terminated.

3,866,896
RESILIENT COIL SPRING ADJUSTER AND METHOD OF FABRICATION
William C. Wehner, Inkster, Mich., assignor to Howard E. Crawford, Dearborn and Robert C. Hauke, Holly, both of, Mich.
Filed Apr. 2, 1973, Ser. No. 346,759
Int. Cl. F16f *1/12*
U.S. Cl. 267—61 S **3 Claims**



1. An adjuster for a coil spring having a spring axis and a dimension between adjacent coil surfaces of the coil spring comprising a plurality of spaced strips of material each formed with its ends adapted to engage respectively facing surfaces of adjacent spring coils and its intermediate portion adapted to flex resiliently resisting compression of said spring coils, said intermediate portion having outer dimensions taken on a line parallel to said spring axis being slightly greater than the dimension between said adjacent coil surfaces taken when said spring in uncompressed, the intermediate portion of each strip connected to its adjacent strip intermediate portion by a connector means.

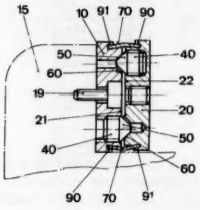
3,866,897
COMBINED VICE AND SAW GUIDE
Raymond Stephen Whalen, Jr., 10625 Itzamana Rd., La Mesa, Calif. 92041
Filed Jan. 14, 1974, Ser. No. 427,434
Int. Cl. B23q *3/06*
U.S. Cl. 269—87.2 **6 Claims**



1. A vice for holding a work piece during metal working operations including severing of the work piece by a band saw comprising,
a base means including a generally planer under surface for support from and movement on a band saw table,
a fixed jaw extending generally vertically upwardly from said base and fixed at one end of said base,
said base and said fixed jaw being cut away to form a substantially V-shaped saw access guide,
said jaw access guide extending over the entire vertical extent of said base and said fixed jaw and terminating in a saw access guide opening,
a slot extending along a substantial portion of said base connecting with said saw access guide opening,
a movable jaw mounted on said base for movement toward and away from said fixed jaw, having a vertical generally planer clamping surface,

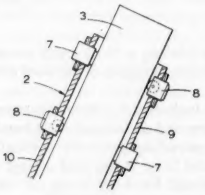
whereby a work piece clamped between said fixed jaw and said movable jaw may be entirely severed by a vertically running and horizontally cutting saw blade guided in said opening by movement of said base on said band saw table.

3,866,898
PULL DOWN JAW
Ernst Spengler, Zeughausstrasse 46, Lenzburg, Switzerland
Filed Apr. 16, 1973, Ser. No. 351,562
Int. Cl. B23q *3/00*
U.S. Cl. 269—138 **1 Claim**



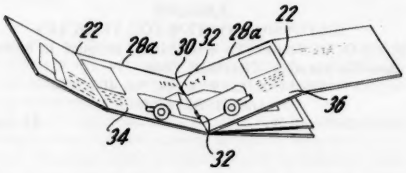
1. Pull down jaw comprising two nearly equal size rectangularly shaped plates abutting each other, flexible elements engaging said plates for lifting of one of said plates relative to the other, screw joints for permitting bracing of said plates at a slant, said plates being provided with a plurality of bracing devices, one section of each bracing device terminating in a generated surface while the other section of the same bracing device is an indentation engageable by said generated surface, said generated surface being a truncated cone including an end of a screw which is mounted in one of said plates nearly perpendicular thereto, said plates bracing one another on these bracing devices only when not under load but abutting each other when under load, said plates including tapered cooperating grooves therein, said grooves being inclined at an angle of up to 8° in the direction of the nucleus of said plates, and said flexible elements being steel spring bands that are bent in the center thereof and clamped into said cooperating grooves.

3,866,899
OPERATION TABLES AND CHAIRS
Norman John Lee, London, England, assignor to Matburn (Holdings) Limited, London, England
Filed May 31, 1973, Ser. No. 365,468
Claims priority, application Great Britain, June 8, 1972, 26732/72
Int. Cl. A61g *13/00*
U.S. Cl. 269—322 **1 Claim**



1. A device for supporting a patient during surgical procedures comprising a base member, an upwardly extending support column fixed to the base and inclined with respect to the vertical, a movable support column reciprocably slidable within and with respect to the inclined support column, a patient-supporting platform mounted atop the movable support means for raising and lowering the movable support and the patient-supporting platform thereon along a plane inclined from the vertical, the support column having two opposite walls in parallel vertical planes and two opposite walls in parallel inclined planes, the movable support reciprocably sliding within the support column, low friction bearings between the fixed support column and the movable support column including a pressure-bearing pad and a pressure-bearing roller mounted on each of the opposing inclined walls of the support colunn, the lower of the inclined walls having the load supporting bearing roller disposed above and spaced from the bearing pad and the upper of the inclined walls having the load supporting bearing roller disposed below the bearing pad, thereby to reduce rocking movement of the movable support about the aforesaid load supporting upper bearing roller on the lower wall with respect to the support column on repeated reciprocation of the movable column with respect to the support column.

3,866,900
METHOD FOR FORMING SPECIAL INSERT FOR ADVERTISING BROCHURES, MAGAZINES AND THE LIKE
John J. Kebba, 1270 Avenue of the Americas, New York, N.Y. 10020
Continuation-in-part of Ser. No. 220,583, Jan. 25, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,355
Int. Cl. B41f *13/58*
U.S. Cl. 270—5 **1 Claim**

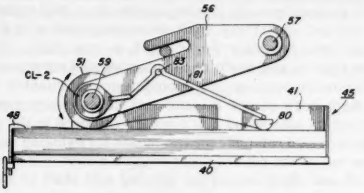


1. A method for forming a 12-page double gate insert of the type suitable for advertising, said method comprising the steps of (a) providing a sheet having printed material on at least one surface thereof, (b) in a folding machine, folding one edge of said sheet over a first fold line formed at a distance from said one edge that is less than or equal to one-third the width of said sheet, (c) thereafter folding in said machine said once-folded sheet over itself along a second central fold line perpendicular to said first fold line, (d) thereafter folding in said machine said twice-folded sheet along a centrally formed third fold line parallel to said first fold line, (e) thereafter applying securing means along said centrally formed third fold line while leaving said one edge unfastened to any other portion of said thrice-folded sheet, and (f) thereafter cutting said thus-folded sheet along at least said second central fold line.

3,866,901
REVERSE BUCKLE FEEDER
John L. Brock, Smithfield, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 1, 1973, Ser. No. 402,233
Int. Cl. B65h *3/06*
U.S. Cl. 271—21 **6 Claims**

1. Apparatus for separating and forwarding individual sheets from a supply stack including:
- sheet feeding means for engaging the top sheet within a stack for moving said sheet in a first direction toward the rear of said stack and then in the opposite direction along a predetermined path of travel;
- holddown means for contacting the top sheet in said stack;
- lever means connected at one end to said holddown means and at the opposite end to said sheet feeding means;
- control means interposed between said lever means and said sheet feeding means including a one way clutch arranged to force said holddown means into pressure contact

against the stack when said sheet feeding means moves said sheet in a rearward direction and to release said holddown pressure when said sheet feeding means moves said sheet in the opposite direction.



3,866,902
ACTUATING APPARATUS FOR A DIVERTER FOR SHEET ARTICLES

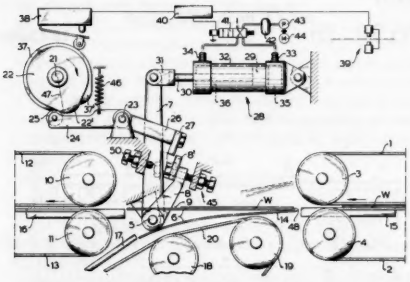
Richard Feldkamper, Lengerich, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed June 12, 1973, Ser. No. 369,198

Claims priority, application Germany, June 15, 1972, 2229286

Int. Cl. B65h *29/60*

U.S. Cl. 271—64 **5 Claims**



1. An actuating apparatus for a diverter for sheet articles moving at equal time intervals along a first path comprising a diverter positioned at a fork junction and being moveable between a first position where said articles are moved along said first path and a second position where selected articles are diverted out of said first path into a second path, an actuating linkage for causing said diverter to move to said second position in response to a signal, control means upstream of said fork junction for monitoring said articles moving along said first path and for delivering said signal, first energy storage means for biasing said actuating linkage so that said diverter is moved to said second position when energy is stored therein, means for storing energy in said first energy storage means during a fraction of one of said equal time intervals in response to said signal and for keeping energy stored in said first energy storage means for a predetermined period, second energy storage means for moving said actuating linkage so that said diverter is moved to said first position when energy is stored therein, locking means for holding said actuating linkage against the bias of said first energy storage means, a shaft rotatable in sequence with said equal time intervals, said locking means being coupled to said shaft and being releasable at least once during each of said equal time intervals, and a lever attached to said diverter, said locking means comprising a double-acting abutment moveable into the path of said lever, said lever being moveable when said diverter is actuated and having corresponding abutments surfaces, said double-acting abutment being moveable to lock said diverter in either said first or second positions.

3,866,903
SHEET FEEDING APPARATUS

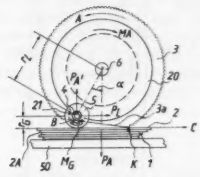
Rudolf Eppe, Taufkirchen; Karl Hartwig, Unterhaching, and Juergen Vossnacke, Pullach, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 27, 1972, Ser. No. 301,601

Claims priority, application Germany, Oct. 30, 1971, 2154223

Int. Cl. B65h *3/06*

U.S. Cl. 271—119 **5 Claims**



1. In a sheet feeding apparatus, particularly for transporting successive topmost sheets of a stack of sheets into the range of sheet advancing means in an electrostatic copying machine whereby the leading portions of successive topmost sheets must bypass corner separators and front stops, a combination comprising a carrier for a stack of sheets including a topmost sheet; a rotary feeding device including a topmost sheet; a rotary feeding device including an elastically deformable element having a peripheral surface normally bearing against the topmost sheet of the stack on said carrier, the material of said element having a high coefficient of friction; and means for rotating said device about the axis of said element so that said element moves the topmost sheet lengthwise, said feeding device further including a disengaging member arranged to disengage said peripheral surface of said element from the topmost sheet in a predetermined angular position of said feeding device, said disengaging member including a roller having a portion extending beyond the peripheral surface of said element and an axis which is parallel to the axis of said element, said roller engaging the topmost sheet of the stack on said carrier in said predetermined angular position of said feeding device, the line connecting the axis of said element with the axis of said roller and the line including the axis of said element and extendng at right angles to the plane of the topmost sheet of the stack on said carrier making in said predetermined angular position of said feeding device an angle alpha which satisfies the equation

$$\sin \alpha = 1/P_A \, (M_G \cos \alpha / r_G - M_A / r_L),$$

wherein M_a is the moment of frictional resistance of said roller, M_A is the moment of frictional resistance of said element, P_A is the bias of said element upon the topmost sheet of the stack on said carrier, r_G is the radius of said roller, and r_L is the distance between the axes of said element and said roller.

3,866,904
MULTIPLE FEED SORTING APPARATUS

Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1972, Ser. No. 319,955

Int. Cl. B65h *29/60*

U.S. Cl. 271—173 **1 Claim**

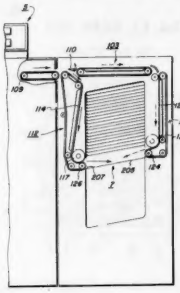
1. Sorting apparatus for receiving sheets from a reproducing machine distributing in both simplex and duplex sorting modes of operation comprising:

a frame,

an array of vertically extending closely spaced tray members adapted to move in a vertical direction relative to said frame,

first transport means for moving sheets towards a first sheet discharge zone adjacent to the path of the moving tray member,

second transport means for moving sheets towards a second sheet discharge zone on the opposite side of the moving tray members from a first discharge zone, and



gate means positioned in the sheet path for directing sheets towards said first or second transport means according to whether simplex or duplex sorting is required,

wherein said tray members are supported on at least one vertically extending cam member having a spiral shape, said cam member being driven by a reversible drive to move the tray members up and down past the sheet discharge zone to receive the copy sheets,

wherein said cam member is formed with a higher pitch camming surface at the sheet discharge zones to effect a spreading movement between tray members upon passing said sheet discharge zones.

3,866,905

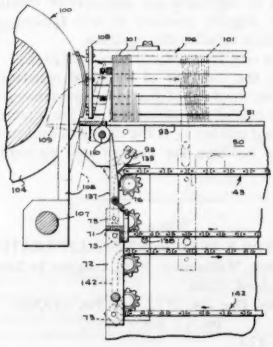
SEPARATOR AND TRANSFER DEVICE FOR PAPER NAPKINS, TOWELS AND THE LIKE

John F. Trogan, Ashland, and James H. Beebe, Bayfield, both of Wis., assignors to C. G. Bretting Manufacturing Co., Inc., Ashland, Wis.

Filed Oct. 4, 1972, Ser. No. 294,920

Int. Cl. B65h *29/22, 33/02*

U.S. Cl. 271—181 **3 Claims**



1. Apparatus for separating and transferring a plurality of non-rigid articles along a generally horizontally disposed path from a source of articles, said apparatus comprising a frame located adjacent to said source, a tray mounted on said frame in a generally horizontal position, one end of said tray being located in a position to receive articles from said source, means for continuously moving articles from said source onto said one end of said tray, shaft means mounted on said frame, at least one separator finger fixed to said shaft, rotatable means fixed to said shaft for maintaining said separator finger in inoperative position until a predetermined quantity of articles have been placed on said tray, lever means swingably mounted on said frame and normally disposed in the path of rotation of said rotatable means, means for swinging said lever means out of the path of said rotatable means to permit rotation of said shaft, means for rotating said shaft so that said separator finger engages and moves the articles away from said one end, at least one transfer member movably mounted on said frame, means for moving said transfer member in a first direction to a position behind and in engagement with said articles on said tray and moving said transfer member in a second direction to move said articles to the opposite end of said tray.

3,866,906

CONVEYING SHEET MATERIAL

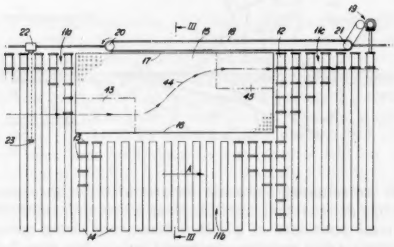
Ronald Frank Berry, Hindley Green, near Wigan, England, assignor to Pilkington Brothers Limited, Liverpool, England

Filed Oct. 17, 1972, Ser. No. 298,387

Claims priority, application Great Britain, Oct. 19, 1971, 48653/71

Int. Cl. B65h *9/02, 35/10*

U.S. Cl. 271—227 **15 Claims**



13. A method of effecting a sideways shift of a forwardly travelling sheet member, comprising conveying the sheet member lying in a generally horizontal plane in a forward direction over a support table provided in the conveying path, passing gas through ducts in the table to provide a gas cushion beneath the sheet member being conveyed, selectively raising one edge of the table to tilt said table from a horizontal position to an inclined position to move the sheet member in a direction transverse to said forward direction while it is supported on the gas cushion, arresting lateral movement of the sheet member at the opposite edge of the table thereby to locate it at a desired lateral position in said transverse direction, returning the table to the horizontal position, and advancing the sheet member in a sideways shifted position onto a downstream conveyor in said generally horizontal plane.

3,866,907
APPARATUS FOR ALIGNING IMAGE WITH BLIND SPOT OF EYE

John Willard Goudie, 6517 Northam Rd., Camp Springs, Md. 20031, and Raymond Lewis Zukowski, 1713 Fenwood Ave., Oxon Hill, Md. 20021

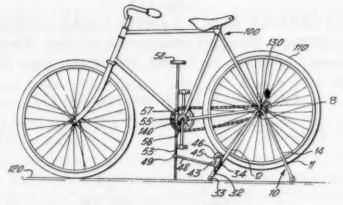
Continuation-in-part of Ser. No. 275,041, July 25, 1972, abandoned. This application Mar. 9, 1973, Ser. No. 339,503
Int. Cl. A63j *5/00*
U.S. Cl. 272—8 R **12 Claims**

1. Apparatus to be disposed upon the head of a viewer for facilitating the alignment of an image of a distant object with respect to the blind spot of the viewer's eye whereby the distant object seems to disappear, said apparatus comprising:
support means for mounting said apparatus on the head of the viewer, in alignment with the viewer's eyes said support means including a member adapted to be disposed across the face of the viewer, said member having first and second slots therein to be aligned with the eyes of the viewer;
an opaque tab member to be aligned in the line of sight of each of the viewer's eyes; and
suspending means for suspending said tab member centrally of and spaced from the eyes of the viewer a distance such that the distant object may be aligned with the blind spot of one of the viewer's eyes, said suspending means disposed remotely of the viewer's lines of sight upon said member.

3,866,908
BICYCLE CONVERSION STAND

Frank X. Hangler, 3117 Connaught Ave., North Vancouver, B. C., Canada

Continuation-in-part of Ser. No. 190,611, Oct. 19, 1971, abandoned. This application Apr. 26, 1973, Ser. No. 354,545
Int. Cl. A63b *69/16*
U.S. Cl. 272—73 **11 Claims**

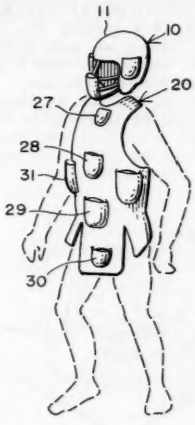


1. A stand for a manually powered vehicle comprising:
a. a support frame assembly including a pair of spaced apart members, each in upstanding relation, and a pair of abutment means including respective transversely extending elongated hollow sleeves mounted on respective ones of said members and projecting towards one another from said members to provide respective first clamping faces in transversely spaced apart, face-to-face relation;
b. a pair of clamping members extending along and within respective ones of said sleeves for sliding movement towards and away from one another in a direction transversely of said support frame, each said clamping member including an elongated stem terminating in an enlarged head portion having a substantially uninterrupted planar surface, and, on a surface opposite to said planar surface, and facing said stem, a second clamping face disposed in face-to-face relation with a respective one of said first clamping faces;
c. a pair of actuating means drivingly engaging respective ones of said stems of said clamping members, each said actuating means engaging said frame for adjusting said clamping members transversely with respect to said frame, for clamping respective portions of a frame of a manually powered vehicle directly between respective ones of said first clamping faces and the associated said second clamping faces; and
d. a roller supporting means pivotally mounted on said support frame, and a roller mounted on said roller supporting means, for movement of said roller into and out of engagement with a driven wheel of a manually powered vehicle whose frame is clamped to said stand, said movement being in response to pivotal movement of said roller supporting means with respect to said support frame.

3,866,909
PROTECTIVE GARMENT FOR KARATE WITH FORCE INDICATING MEMBERS THEREON

Nino M. DeSantis, Miami, Fla., assignor to Salvatore G. Militana, Miami Shores, Fla., a part interest

Filed Apr. 9, 1973, Ser. No. 349,423
Int. Cl. A63b *69/00;* **A41d** *13/00*
U.S. Cl. 272—76 **5 Claims**



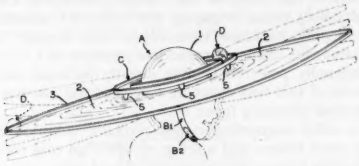
1. A uniform for combatants engaging in Karate and the like comprising a protective garment consisting of blow absorbing material, means mounted on said material for securing said garment about the torso of said combatants, a plurality of force indicating means mounted on said garment and positioned so as to cover the vulnerable parts of the body of each of said combatants for indicating when a blow of predetermined force has been inflicted on one of the combatants by the other, each of said means consisting of a pliable member forming an enclosed chamber inflated so as to only contain matter consisting essentially of fluid material, said fluid material including a substantial proportion of gas, said member requiring said blow of predetermined force to become ruptured and to simultaneously emit a substantially loud noise to indicate reception of said blow at one of said vulnerable parts of not less than said predetermined force by said one of said combatants and further means removably securing said pliable members to said garment whereby ruptured members are readily replaced by unruptured members.

3,866,910

NECK EXERCISING DEVICE

Bernard D. Herring, 712 Longride Rd., Oakland, Calif. 94610

Filed Jan. 7, 1974, Ser. No. 431,103
Int. Cl. A63b *21/18, 21/22, 23/00*
U.S. Cl. 272—80 4 Claims



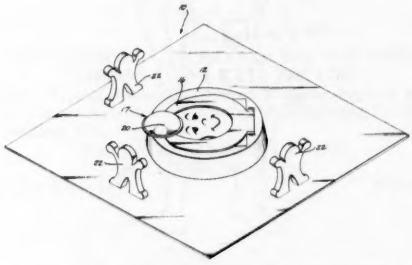
2. A device of the type described comprising:
a. a hemispherical crown to fit over the head;
b. a brim extending from the crown with the plane of the brim lying substantially in the plane of the open end of the hemispherical crown, said brim having an upturned circular flange at its outer edge to prevent a ball from falling off from the brim;
c. a circular track extending around the crown and being spaced therefrom; and
d. a plurality of legs extending at right angles from said brim for supporting said track above said brim.

3,866,911

GAME APPARATUS WITH ROTATING STRIKER MEANS

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356; George C. Strader, and Judy D. Strader, both of Paso Robles, Calif., assignors to Adolph E. Goldbarb, Tarzana, Calif., by said Strader and Strader

Filed Feb. 21, 1973, Ser. No. 334,442
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 R 19 Claims



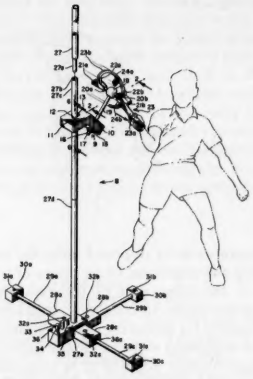
1. Apparatus for producing variably directed impact strokes comprising:
a rotatable member having a top surface and having an axis of rotation;
a striking element pivotally coupled to the rotatable member and having an axis of pivoting at an angle of substantially 90° with respect to said first mentioned axis of rotation, the striking element being positioned so that centrifugal force is exerted thereupon due to rotation of the rotatable member to dispose the striking element in a set position adjacent said top surface of said rotatable member; and
impelling means coupled to the striking element to exert force upon the striking element in a substantially opposite direction to the centrifugal force, to pivot said striking element through approximately 180° to a striking position spaced from said set position upon substantial reduction of rotation of said rotatable member.

3,866,912

TENNIS-STROKE PRACTICE TARGET COMBINATION

Jack P. Scainetti, 198 Euston Rd. S., Garden City South, N.Y. 11530

Continuation-in-part of Ser. No. 381,047, July 20, 1973, abandoned. This application Nov. 5, 1973, Ser. No. 412,636
Int. Cl. A63b *69/38*
U.S. Cl. 273—29 A 11 Claims



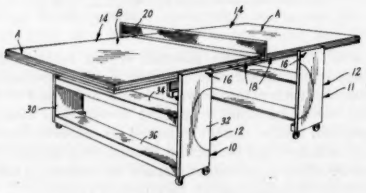
1. A tennis-stroke practice target device comprising in combination: A base and an elongated upright guide post supported by said base providing support intermediate its ends for a support arm, said support arm being elongated and having one end extending outward from said upright guide post; an elongated target mounted on the distal end of said support arm remote from said upright guide post, said target providing guidance in the follow through of a tennis practice stroke and being suspended with its elongated axis extending substantially perpendicular to said upright guide post, each opposite end of said target being provided with an elongated member having tapered ends with enlarged cross-section, becoming larger progressively from each end towards an intermediate portion of said elongated member; said elongated member also having mounted thereon a target structure of substantially spherical shape resembling a tennis ball and mounted intermediately between said elongated members and being integral with said elongated target.

3,866,913

CONVERTIBLE TABLE TENNIS TABLE ASSEMBLY

Melvin Zimmers, Westport, and Gary A. Gerber, Weston, both of Conn., assignors to Coleco Industries, Inc., Hartford, Conn.

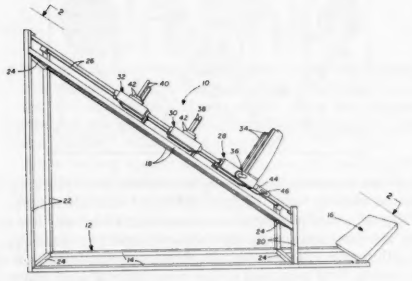
Filed Feb. 7, 1973, Ser. No. 330,175
Int. Cl. A63b *67/04*
U.S. Cl. 273—30 33 Claims



1. A convertible game table assembly adapted for coupling with a second game table assembly of similar construction comprising:

a. a base having a pair of spaced sidewalls;
b. an elongated generally rectangular table member having ends and sides;
c. means connecting said sidewalls to said table member sides to pivotably support said table member in both a horizontal table position and vertical storage position on said sidewalls for movement about an axis perpendicular to said sidewalls and the sides of said table member; and
d. means for aligning and coupling said table member of said game table assembly with the table member of a similar game table assembly including coupling means movably mounted on said table member for movement between a fully retracted storage position and an outwardly extended coupling position extending beyond an end of said table member when said table member is in said horizontal table position in which said couping means is adapted for coupling with a table member of an associated similar game table assembly.

3,866,914
VARIABLE WEIGHT RESISTANCE FOOTBALL TRAINING DEVICE
Donald W. Jackson, Metairie, La., assignor to Bruce Boswell, Ft. Worth, Tex.; a part interest
Filed May 24, 1971, Ser. No. 146,254
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 R **7 Claims**

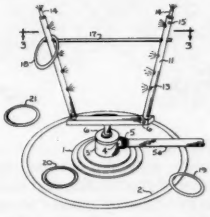


1. An exercise device comprising:
a base member having a guide, said guide being upwardly inclined relative to said base member;
a first member slidably supported on the guide for movement from a normal position upwardly along a predetermined path under direct muscular action of a user and against the action of gravity, said member presenting sufficient resistance to sliding movement to tax the muscles of the user;
means responsive to movement of the first member through first and second predetermined distances upwardly along the path for abruptly applying additional forces to the member which further oppose movement of the member upwardly along the path,
said additional force applying means comprising:
a second member supported on the guide in the path of the first member for engagement by the first member upon movement thereof through the first predetermined distance and thereafter for movement with the first member upwardly along the guide; and
a third member supported on the guide for engagement by the second member only after movement of the first and second members through the second predetermined distance and thereafter for movement with the first and second members upwardly along the guide.

3,866,915
PLAYER PIECES FOR VIBRATORY GAME APPARATUS
Henryk Rzepczyk, Lachine, Quebec, Canada, assignor to Coleco Industries, Inc., Hartford, Conn.
Filed Mar. 12, 1973, Ser. No. 340,119
Int. Cl. A63f *9/14*
U.S. Cl. 273—85 R **17 Claims**

14. A player piece for game apparatus having a vibratory board surface upon which the player piece is movable by vibratory action comprising:
a base having a sidewall and a top wall with a depending portion of generally circular cross section providing an upwardly opening cavity of circular cross section, said base having a multiplicity of resiliently deformable leg elements depending from said depending portion to below the level of the lower edge of said sidewall to support the player piece upon the playing board surface;
a cap having a generally cylindrical sidewall and a top wall, said sidewall of said cap being cooperatively dimensioned to rotatably seat within said cavity; and
a player figure mounted on said top wall of said cap for rotation therewith, whereby said cap and player figure may be rotated relative to said base while said leg elements retain their original orientation.

3,866,916
WATER ACTUATED RING TOSS TARGET
William A. Clarke, 1001 Linden Ave., Erie, Pa. 16505
Filed Dec. 7, 1973, Ser. No. 422,904
Int. Cl. A63b *71/02*
U.S. Cl. 273—105.2 **6 Claims**

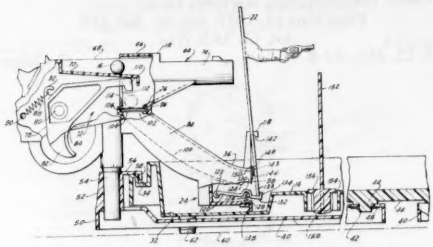


3. A rotatable ring toss lawn sprinkler toy comprising a base, a set of rings, a hollow head, means for journalling the head on the base, a hose fitting in said base for conducting water under pressure into the interior of said head, an upstanding hollow pin having its lower end fixed to said head and communicating with the interior of said head and having its upper end free to receive rings, said head and pin constituting a rotatable element provided with water spray nozzles and means for rotating the head to shift the position of the pin.

3,866,917
GUNFIGHT GAME
Burt Ensmann, Flushing; Michael Ieda, Ft. Solanga, and Madhusudan Joshi, Hempstead, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed July 6, 1973, Ser. No. 376,990
Int. Cl. A63f *7/10*
U.S. Cl. 273—120 R **15 Claims**

1. A toy gun comprising a housing in the shape of a gun,

means in said housing for discharging a projectile from the housing, a target operatively engaged with and removably



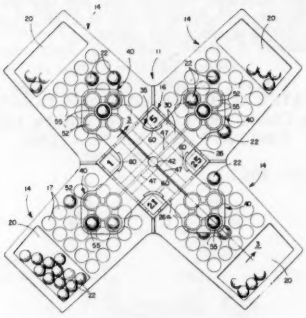
mounted on said housing, and means in said gun shaped housing responsive to an impact against said target for indicating that said target has been hit by a projectile from another source.

3,866,918

PIECE ALIGNMENT GAME WITH OVERLYING MEMBERS

Adolph Eddy Goldfarb, Tarzana, and Howard L. Dekan, Chatsworth, both of Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.

Filed Feb. 21, 1973, Ser. No. 334,390
Int. Cl. A63f *3/00*
U.S. Cl. 273—135 AC **19 Claims**



1. A game comprising:

a base member having a plurality of areas, each of said areas having a plurality of receptacles, said base member further having a portion thereof marked to indicate a plurality of groups of segments, each group of segments having a different indicia thereon,

an upper member positioned over said base member in overlying relationship and having a plurality of areas, each area of the upper member corresponding to an area of the base member, an indicator on the upper member overlying at least a portion of the marked portion of the base member for selective alignment with one of the segments of the base member, a plurality of apertures being formed in the areas of the upper member, at least some of the apertures of each of the areas overlying receptacles of the corresponding area of said base member,

a marker member for selectively marking at least one of the apertures of each of the areas of the upper member,

a plurality of pieces adapted to fit through the apertures in the areas of the upper member and into the receptacles in the areas of the base number, and

chance selector means for randomly selecting one of the indicia of the base member segments,

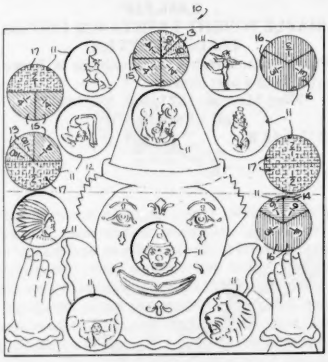
whereby the marker members are each placed at one of the apertures of each of the upper member areas, said selector means is then operated to select one of said indicia, and said upper member is positioned with the indicator thereof over any segment of the base member having the selected indicia, one of the pieces then being placed through each aperture marked by said marker member into an opposite base member receptacle, the players attempting to form a predetermined arrangement of said pieces in the receptacles of said base member.

3,866,919

GAME APPARATUS

Jeffrey David Powell, Forest Hills, N.Y., assignor to Teaching Concepts, Inc., New York, N.Y.

Filed May 24, 1973, Ser. No. 363,635
Int. Cl. A63f *3/00*; **G09b** *23/02*
U.S. Cl. 273—135 AC **4 Claims**



1. Game apparatus comprising in combination a plurality of identical playing fields of predetermined individual area, a plurality of sets of playing pieces, the pieces within any one set being identical and having for each set respective areas equal to a different predetermined simple proper fractional unit of said playing field area, said pieces being shaped such that any combination of pieces whose total area equals said predetermined area can be assembled to coincide with and completely fill one of said playing fields, there being a sufficient number of pieces to fill all of said playing fields, and means for enabling each player at his turn to select separately by chance that one of said sets from which pieces are to be played and the number of pieces to be played from said selected set, said last mentioned means comprising a pair of chance devices, one of which is associated with indicia indicative of the number of pieces to be played, and the other of which is associated with two separate sets of indicia designating, respectively, playing pieces equal in area to a first and second set of said different fractional units of said playing field area, and said sets of playing pieces have indicia designating their respective different fractional unit areas.

3,866,920

PLAYPIECE AND BASE MEMBER SELECTIVELY INTERENGAGEABLE TO ACTUATE EFFECT MEANS

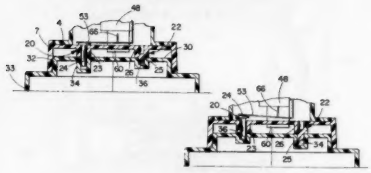
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316

Filed Feb. 19, 1974, Ser. No. 443,772
Int. Cl. A63f *9/00*
U.S. Cl. 273—138 A **12 Claims**

1. Game apparatus comprising:

a. a base member selectively movable between a plurality of different orientations;

b. a playpiece member positionable on the base member in at least two different positions relative thereto;
c. effect means for being actuated incident to the relative positioning of the playpiece member on the base member to produce an effect related to play of the game;
d. first actuating means on said base member and second actuating means on said playpiece member for interacting, said first and second actuating means being positioned in interacting relationship to one another whereby they will actuate the effect means when the playpiece member is in at least one of said relative positions, said

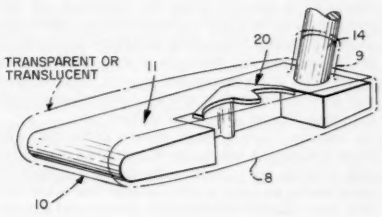


first and second actuating means being positioned in non-interacting relationship to one another whereby they will not actuate the effect means when the playpiece member is in at least a different one of said relative positions; and
e. nonactuating means on at least one of said members simulating in appearance the actuating means on said at least one member, said nonactuating means being configured and arranged not to cause the effect means to be actuated when said nonactuating means is positioned in said interacting relationship with the actuating means on the other member.

3,866,921
SHELL GAME
Elizabeth A. Klock, 1614 N.E. 173rd St., North Miami Beach, Fla. 33162
Filed Aug. 23, 1974, Ser. No. 500,139
Int. Cl. A63f *9/00*
U.S. Cl. 273—138 R **5 Claims**

1. A game intended to be played by two and more players comprising:
a pair of dice, each die being six-sided and having indicia representing the numerals one – six disposed on respective sides thereof;
a pair of identical open topped bowls each having a compartment defined therein;
a first group of a multiplicity of shells each having the same general configurations and coloring;
a second group of a multiplicity of shells each having the same general configuration and coloring to each other;
means distinguishing the second group of shells from the first group of shells;
a single third shell of an identical configuration and color to the second group of shells and intended for use therewith;
marking indicia on one surface of each of the second group of shells, the marking indicia being in the form of numerals selected from the group of numerals **1** through **9**;
marking indicia on one surface of each of the first group of shells, the marking indicia being in the form of numerals selected from the group of numerals **1** through **9**;
marking indicia on one surface of the third shell distinctively identifying the third shell from the shells of the second group of shells.

3,866,922
GOLF PUTTER WITH IMBEDDED ALIGNMENT INDICATOR
Vincent C. Marci, 236 Maryal Dr.; James E. Osborn, 486 Belment Dr., and David F. Watkins, 828 Via Maria, all of Salinas, Calif. 93901
Filed Nov. 24, 1972, Ser. No. 309,200
Int. Cl. A63b *53/04*
U.S. Cl. 273—164 **4 Claims**

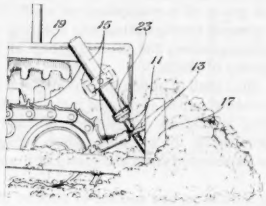


1. (Amended) A golf putter head of a generally elongated type having a generally flat putter face, comprising:
a putter head fabricated from a light transmitting material and having an externally visible alignment indicating means completely imbedded therein for indicating the proper alignment between the putter face and a golf ball, said putter head having a weight means imbedded therein to provide said putter with satisfactory impact imparting characteristics and to broaden the sweet spot on said putter face, said weight means comprising a homogeneous member including a toe portion having greater mass than a heel portion thereof and a body connecting said toe and heel portions, said toe and heel portions each extending forwardly from said body towards said putter face to define a sight window adjacent said putter face as viewed from above, said heel portion being adapted for attachment to a putter handle, said alignment indicating means being positioned in said window, said indicating means including an elongated alignment indicator positioned perpendicularly to said putter face approximately adjacent the sweet spot on said putter face and a generally arcuate strip terminating in pointed tips in said window adjacent said putter face, each of said tips being equal distance from said indicator on either side thereof.

3,866,923
SEALING ROD WIPER

Gerald W. Gorman, Rt. 2, Box 320, Midlothian, Tex. 76065

Filed Oct. 26, 1973, Ser. No. 409,905
Int. Cl. F16j 15/16
U.S. Cl. 277—24 9 Claims



1. A rod wiper for sealing intermediate a cap ring and a rod disposed concentrically therewithin; said cap ring having a planar exterior surface, a recess disposed concentrically about said rod, and extending inwardly of said recess a shoulder defining a concentric surface of smaller diameter than said recess and larger diameter than said rod; said rod wiper comprising:

a. an annular base ring adapted for conformably fitting within said recess of said cap ring and having a first inner diameter larger than the first outer diameter of said rod, and having operationally innermost and outermost surfaces;

b. an annular neck portion connected with said outermost surface of said base ring at its radial interior and extending away from said base ring at its radial interior; said neck portion being adapted for extending upwardly through the annular space between said rod and said concentric surface; said neck portion also having an inner diameter greater than a first predetermined outer diameter of said rod and having a second outer diameter no larger than a predetermined second inner diameter of said concentric surface and adapted to loosely and conformingly fit said concentric surface; and

c. an annular exterior wiper portion connected with said neck portion and adapted to fit exteriorly of said cap ring; said exterior wiper portion having an enlarged annular head having an inner wiper diameter that is less than said first inner diameter of said neck portion and less than said first predetermined diameter of said rod so as to form an interference to fit with said rod when said rod is inserted therethrough; said enlarged head having an outer sealing diameter greater than said predetermined second inner diameter of said concentric surface and having an inner surface that is adapted to provide an operationally planar fit with said planar surface of said cap ring; said exterior wiper portion having a compression means intermediate said wiper inner diameter and said sealing outer diameter for maintaining respective wiping and sealing contacts with said rod and said cap ring;

whereby said rod wiper can be installed with its base within the recess within said cap ring and said rod inserted therethrough and said wiper portion is forced into interference fit with said rod and said cap ring to provide exceptionally long lived and clean wiping action on said rod.

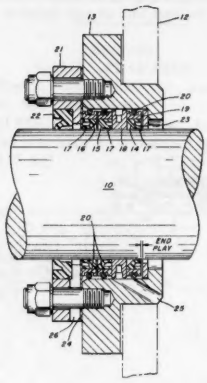
3,866,924
WIPER AND DIAPHRAGM SEAL DEVICE

Joseph W. French, Garland, Tex., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 16, 1973, Ser. No. 389,601
Int. Cl. F16j 15/34
U.S. Cl. 277—59 3 Claims

2. In a mechanism which includes an axially movable elongated member subject to limited transverse displacement, a housing through which said member extends, a wiper and seal device within said housing encompassing said member, and means holding said device in said housing, the improvement in which said device comprises:

wiper rings of relatively inflexible material having a low coefficient of friction and being of U-shape in cross section and having lips which extend substantially parallel with the surface of said member and closely hug said member;



the lips of at least one of said wiper rings facing in one direction and the lips of at least another of said wiper rings facing in the opposite direction to afford a two-way seal against fluid leaking in either direction around said member; and

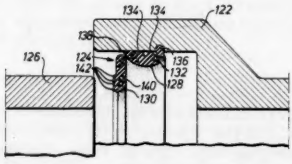
flexible resilient O-rings encircling each of said wiper rings and bearing against the inner circumferential face of said housing;

whereby said wiper rings float with said member on transverse displacement of the latter.

3,866,925
DEVICE FOR INCREASING THE ELASTIC FORCE OF AND REINFORCING OBJECTS MANUFACTURED FROM AN ELASTIC MATERIAL

Sven-Erik Maimstrom, Naters, and Sten Sporre, Forsheda, both of Sweden, assignors to Forsheda Ideutveckling AB, Varnamo, Sweden

Filed Jan. 30, 1973, Ser. No. 328,025
Claims priority, application Sweden, Jan. 31, 1972, 1048/72; June 5, 1972, 7335/72; June 19, 1972, 8023/72; Oct. 6, 1972, 12905/72
Int. Cl. F16j 15/12
U.S. Cl. 277—164 21 Claims



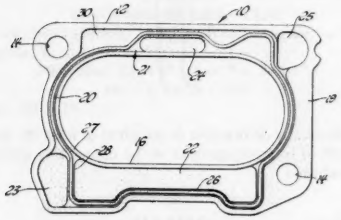
1. An object composed of elastic material and provided with strengthening means embedded within said elastic material, wherein the strengthening means comprise a spring element comprising a flattened helix or coil spring having its windings positioned within a plane substantially parallel with the longitudinal axis of the object, said windings being positioned to

enclose portions of the elastic material so that the enclosed portions are subject to a compression when the object and the spring element are subject to a tensile stress.

3,866,926
CARBURETOR GASKET

Robert J. Traum, Trenton, Mich., assignor to McCord Corporation, Detroit, Mich.

Filed Mar. 19, 1973, Ser. No. 342,329
Int. Cl. F16j *15/10*
U.S. Cl. 277—166 **21 Claims**

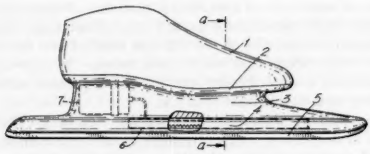


1. A gasket assembly adapted to be disposed between two members comprising: body means defining two parallel surfaces each of which is adapted to abut one of the members, an opening extending through said body means, and sealing bead means disposed about the periphery of said opening; said body means including first recess means for receiving said sealing bead means and second recess means for defining insulating cavities between the members.

3,866,927
ICE SKATE HAVING A ONE-PIECE SUPPORT PROVIDED WITH A HEATING ELEMENT

Nils Joergen Tvengsberg, Olav Trygvasonsvei 7F, 1412-Sofiemyr, Norway

Filed Mar. 1, 1973, Ser. No. 336,961
Int. Cl. A63c *1/00*
U.S. Cl. 280—11.12 **1 Claim**

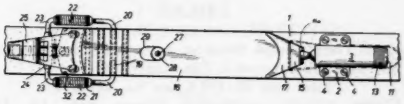


1. A skate assembly comprising a boot plate member for mounting a boot thereon, an elongated intermediate member depending from said boot plate, a skate blade support member for supporting a skate blade therein including means defining a plurality of openings therein, said boot plate, intermediate member and skate blade support member being formed of a one-piece, uninterrupted moldable plastic material with the material in said support engaging through said openings to secure said blade thereto, said members shaped to define an aerodynamic profile, and a heating element in said support member operable to maintain said blade at a predetermined temperature.

3,866,928
SAFETY SKI BINDING

Ernst Gertsch, Wengen, and Ulrich Gertsch, Matten, both of Switzerland, assignors to Gertsch AG

Filed Nov. 8, 1972, Ser. No. 304,736
Claims priority, application Switzerland, Nov. 17, 1971, 16696/71
Int. Cl. A63c *9/081*
U.S. Cl. 280—11.35 K **14 Claims**

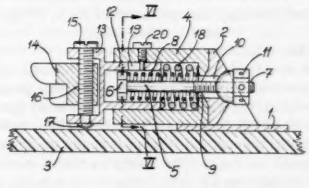


1. A releasable ski binding for a ski comprising a release plate intended to be releasably secured to a ski boot, said release plate being provided at one end with a supporting surface, a holder element for attachment to the ski, said holder element including a holding surface which engages with the supporting surface of the release plate, a spring-loaded locking pin cooperating with the other end of the release plate, means for adjusting the spring-loading of said spring-loaded locking pin, said release plate being releasable laterally as well as upwardly with regard to the ski, a substantially circular-shaped bearing disc for attachment to the ski, said release plate having a lengthwise extending slot which engages said bearing disc, so that said release plate can pivot about the bearing disc, can displace in the lengthwise direction relative thereto and can be raised away from said bearing disc, said supporting surface of the release plate and the holding surface of the holder element forming a lateral guide with regard to the axis of the bearing disc, said supporting surface of the release plate and the holding surface of the holder element cooperating with one another to provide selective vertical release action, said lateral guide having an arcuate surface cooperating with an arcuate surface of said release plate for freely permitting pivoting of said release plate, said spring-loaded locking pin providing both lateral release action and vertical release action for said binding, said spring-loaded locking pin in conjunction with said bearing disc providing different release moments for the ski binding for the vertical release action and for the lateral release action, respectively.

3,866,929
SKI BINDING

Daniel Lacroix, 76 route de Viver Bois d'Amont, Les Rousses, France 39220

Filed Aug. 17, 1973, Ser. No. 389,211
Claims priority, application France, Aug. 21, 1972, 72.29785; Aug. 3, 1973, 73.28540
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **10 Claims**



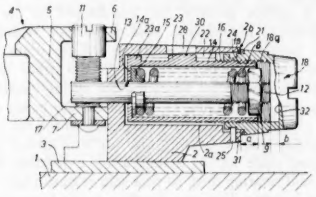
1. Safety ski binding, comprising a plate adapted to be fixed on a ski surface, a stop member fixed on the plate, an elongate hollow body having a first end and a second end and a longitudinal axis extending from the first end to the second end, means for pivotally connecting said body towards the first end

thereof to the stop member for pivotal movement of the body about at least two distinct pivoting axes, a boot-sole engaging jaw mounted on said body at said second end thereof, and adjustable spring means disposed within said body for holding said body in a rest position relative to said stop member with said longitudinal axis substantially parallel to said ski surface and with said jaw in a boot-sole engaging position and for opposing movement of said body away from said rest position by pivoting about at least one of said pivoting axes.

3,866,930
SAFETY RELEASABLE SKI BINDING

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Francois Salomon & Fils, Annecy, France

Filed Feb. 12, 1974, Ser. No. 441,814
Claims priority, application France, Feb. 14, 1973, 73.05190
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 T **14 Claims**



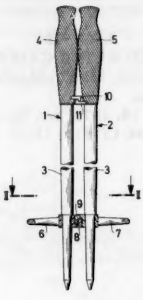
1. Disconnectable safety stop for a ski, comprising a body mountable on the ski, a jaw pivotably mounted on the said body for holding the toe end of a ski boot in a central position of rest, resilient means arranged longitudinally in respect of the ski in a longitudinal hollow portion of the said body and acting on the said jaw in the direction of the central position for securing the boot, an intermediate connecting member at least partly held in the said hollow portion and connecting the said jaw to one end of said resilient means remote from said jaw, and means for adjusting the tension of said resilient means, said tension adjusting means comprising a regulating member and an elongate member extending into the longitudinal hollow portion of the body coaxially with said resilient means and said intermediate connecting member, the said elongated member being provided, at its end remote from the jaw, with a screw-threaded portion onto which said regulating member is screwed such that said regulating member engages the body, said resilient means bearing, by its other end close to the jaw, on the other end of the said elongate member.

3,866,931
PAIR OF SKI POLES

Hannes Marker, Hauptstrasse 51-53, Garmisch-Partenkirchen, Germany

Filed Feb. 6, 1974, Ser. No. 439,973
Claims priority, application Austria, Feb. 9, 1973, 1201/73
Int. Cl. A63c *11/22*
U.S. Cl. 280—11.37 B **3 Claims**

1. A pair of ski poles, each comprising a tubular shaft having an upper portion carrying a handle and a lower portion carrying a snowhead, the handles and the snowhead having interlocking connecting elements whereby the two poles can be detachably interconnected, the snowheads being asymmetrically mounted on the tubular shafts so that a portion of the periphery of each snowhead is close to the tubular shaft, said portions having the interlocking connecting elements whereby the two snowheads can be interconnected, the connecting element of the handle of one ski pole engaging the connecting element of the handle of the other ski pole from below and the connecting element of the snowhead of said one ski pole engaging the connecting element of the snowhead of said other ski pole from above to prevent a longitudinal movement of the ski poles relative to each other, and the tubular shafts

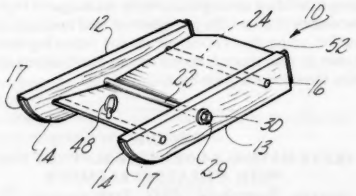


being elastically deformable in length to at least the extent of the depth of interengagement of the connecting elements of the snowheads.

3,866,932
SLED

Josip Milicevic, 23001 Euclid, St. Clair Shores, Mich. 48082

Filed June 22, 1973, Ser. No. 372,697
Int. Cl. B62b *13/16*
U.S. Cl. 280—12 R **1 Claim**



1. A sled for gliding over snow and ice, said sled comprising:
a pair of parallel, longitudinally extended runners, each having three longitudinally spaced bores, said runners having arcuately rounded forward sections that terminate in a longitudinal edge adapted to ride on a snow surface;
a pair of metal ribs of a width less than that of said runners and which extend along the full longitudinal edge of said runners terminating at the top rear edge of said runners, said ribs being attached to said runners by a suitable fastening means thereby providing for greater stability when said sled is used over ice;
three parallel and laterally disposed bar members, cylindrical in shape, and which terminate in reduced diametered end sections forming shoulders adapted to be inserted into said longitudinally spaced bores in said runnerss to positively maintain said runners' parallel relationship, the center bar member being provided with threaded ends extending through said runners for a threaded engagement with nuts on the opposite sides of said runners to secure said runners to said bar members in order to provide quick assembly and disassembly of said sled;
a seat comprising a flat board, said board having a front section and a rear section respectively disposed in planes intersecting at an obtuse angle at a central section of said seat, said seat being disposed between said runners such that the bottom sides of said front and rear sections of said seat are in an abutting supporting relationship, respectively, with the top surfaces of the foremost and rearmost of said bar members, the top side of the midsec-

tion of said seat being in an abutting support with the bottom portion of said center bar member, said seat extending beyond the ends of said runners and terminating with angled edges which form a trapezoidal protrusion which may be grasped by a human hand for facilitating manipulation of said sled to control the direction of movement of said sled; and

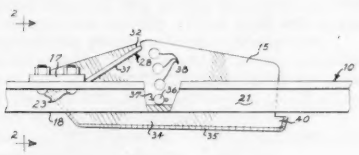
a ring of a diameter sufficient to permit grasping thereof by a human hand and being affixed to said seat near the edge of said front section and midway between said runners such that said sled may be towed and controlled during use.

3,866,933

SNOWMOBILE SKI GUIDE

Frederick Jay Mollring, Jackson, Wyo., assignor to Mollring Snoglide, Inc., Jackson, Wyo.

Filed Mar. 23, 1973, Ser. No. 344,174
Int. Cl. B62b *17/08*
U.S. Cl. 280—28 **7 Claims**



1. An accessory for a vehicular ski of the type having a longitudinal central well extending along the length thereof and a longitudinal central slot formed through the bottom wall of the well beneath a turning axis of the ski; the accessory comprising:

bracket means adapted to be fixed to the ski at opposite sides thereof, including opposed support members adapted to fit into the well along the side walls thereof;

a pivot pin adapted to be carried by the respective support members of said bracket means at a location adjacent the forward end of the slot formed through the ski;

an upright blade pivotally mounted about the pivot pin and adapted to extend rearwardly therefrom when mounted on a ski, the blade being centered across the pin so as to be aligned with the slot of the ski and having a lower portion of the blade adapted to protrude through the slot; yieldable means engageable with the blade adapted to urge the lower portion thereof downwardly when the accessory is mounted on a ski;

said blade further comprising a rearwardly projecting tab at the lower blade portion adapted to protrude rearwardly beyond the slot as an extension of the blade and adapted to limit upward pivotal movement of the blade relative to the ski by abutment of the tab against the bottom surface of the ski.

3,866,934

GOLF CART UMBRELLA HOLDER

Robert A. Braun, 4904 Karen S.W., Wyoming, Mich. 49508

Filed May 14, 1973, Ser. No. 359,852
Int. Cl. B62b *1/04*
U.S. Cl. 280—36 C **11 Claims**

1. In a hand-pulled gold cart having a generally upright frame, a pair of wheels mounted at the lower end of the frame, a handle mounted on the frame, and mounting means for holding a golf bag, an improvement comprising:

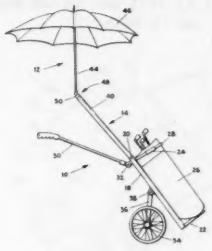
a hollow outer tube with an open upper end;

a hollow inner tube that fits within the outer tube through the open top thereof and is slidable therein in telescoping fashion from a collapsed position to a raised position, said inner tube having an open upper end;

attachment means for attaching the tubes in a generally upright position to the frame of the golf cart;

holding means adapted to releasably hold the inner tube in place when it has been raised to its raised position;

an umbrella comprising a shaft having a collapsible top on one end and an umbrella handle on the other end, said



top and shaft being of a size sufficient to permit the shaft and top to be stored inside the inner tube when the top is collapsed, said umbrella handle being formed so as to be engageable with the outer end of the inner tube in such a manner as to hold the umbrella in a generally upright position when the umbrella is withdrawn from the inner tube.

3,866,935

SUSPENSION FOR UTILITY TRAILER

Charles C. Nelson, 1036 A Del Mar Ave., Richardson, Tex. 93109

Filed Jan. 30, 1973, Ser. No. 327,940
Int. Cl. B60p *1/18*
U.S. Cl. 280—43.23 **11 Claims**

1. A trailer comprising

a frame having means at its front end for coupling to a towing vehicle; suspension means comprising a ground engaging wheel mounted at each side of said frame intermediate the ends thereof;

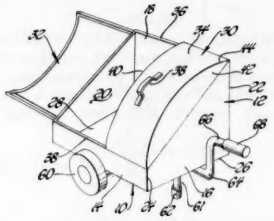
mounting means for each wheel comprising a crank arm mounted to oscillate about a transverse axis, and coacting rotatable support means on said frame and crank arm defining said transverse axis; said crank arm defining first arm means carrying a wheel spindle in spaced relation to said transverse axis, and defining second arm means carrying an operating pivot in spaced relation to said transverse axis;

an extensible fluid motor, having an expansible chamber, mounted between said frame and said crank arm operating pivot, operable in extended condition to position said crank arm and wheel to support said frame in elevated transport condition, and operable in retracted condition to lower said frame relative to said wheel; said motor expansible chamber defining, at least in part, a cushioning air chamber providing an air spring suspension between said frame and said crank arm;

and control means mounted on said frame, for said extensible fluid motors; said control means comprising a reservoir for operating fluid for said extensible fluid motors; conduit means communicating said reservoir with said fluid motors, and flow control means associated with said reservoir and said conduit for directing fluid under pressure to said extensible fluid motors to extend said motors,

and for releasing fluid from said motors to effect retraction of said motors.

3,866,936
TRASH CART
James H. Hedges, 35709 Schley, Westland, Mich. 48185
Filed Oct. 12, 1973, Ser. No. 405,865
Int. Cl. B62b *1/10*
U.S. Cl. 280—47.26 **8 Claims**



1. In a cart for transporting trash, the improvements comprising:

a body member having four sides and a bottom;

the bottom being substantially rectangularly shaped and each of the sides being attached at the bottom portions thereof to said bottom portion;

one pair of said sides being parallel with one another and perpendicular to another pair of said sides which are in turn perpendicular to one another;

each of said sides of said first mentioned rectangular pair being substantially rectangularly shaped, with one side having a substantially lesser height than the other of said sides of said first mentioned pair;

each of said sides of said second mentioned pair of sides being substantially congruent with respect to one another and each being in the shape of a trapezoid with the higher height of said trapezoid attaching to the one of said first mentioned pair of sides having the higher height and the lower height of each of said trapezoidal sides being attached to said other one of said first mentioned pair of sides having a lower height;

an axle and ground engaging wheel assembly being attached near the rear portion of each one of said first pair of rectangular sides;

a handle member being in the shape of an ell and having a forward extending portion extending forward of said cart and a lower downwardly depending portion integral therewith and being attached near the central portion of the forward one of said second pair of trapezoidal shaped sides;

a third ground engaging member attached near the forward center portion and extending downwardly from said bottom portion;

a lid member having a substantially upwardly extending curved portion and a substantially rectangularly shaped bottom edge engaging the top edges of said side portions; said bottom portions of said lid member being of substantially the same shape and dimension as the top edge peripheries of said sides;

each of said sides, said bottom and said lid being made of a relatively thin gauge of metal;

said cart operable to rotate about the axis of said wheel and axle assemblies in an upwardly pitching direction responsive to the manual lifting of said cart at the aforementioned handle;

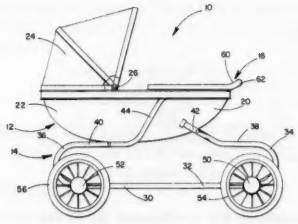
said cart operable to be wheeled on said wheel and axle assemblies for translation with respect to the ground responsive to a pulling on said handle in a direction forward of said cart and operable to be pushed in a backward direction by translation with respect to the ground by rolling on said aforementioned wheel and axle assemblies responsive to a pushing in a backward direction by said handle;

said cart operable to rotate with respect to the ground responsive to a force applied by manual means on said handle in a direction at an angle to the forward or backward direction with respect to said cart by rolling on said wheel and axle assemblies in response to said force;

said lid operable to be manually lifted for loading and de-loading of trash within the body of said trash cart;

whereby trash may be stored within said cart and also transported to a place of dumping or collection by de-loading said cart at the point of collection or dumping.

3,866,937
HIGH-STABILITY WHEELED PUSH DEVICE
Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356
Filed Nov. 20, 1972, Ser. No. 308,246
Int. Cl. B62b *7/00*
U.S. Cl. 280—47.38 **6 Claims**

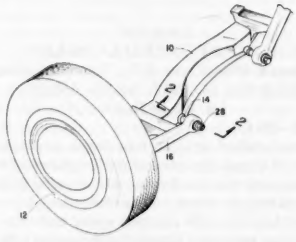


1. A stable wheeled carriage comprising:

a carrier section having a front end and a rear end,

a carriage assembly connected to the carrier section for supporting the latter in an elevated position and having fixed-location transversely extending rear wheel axle means adjacent the rear end of said carrier section, and a pushing means secured to the rear end of the carrier section and including a gripping portion comprising a transversely extending bar, said gripping portion being disposed entirely forwardly of said rear wheel axle means, the latter means being configured to permit access to said gripping portion of said pushing means without interfering with a person utilizing the gripping portion.

3,866,938
CAMBER ADJUSTING MEANS
Elmer E. Boyd, 7559 E. 49th St., Bldg. 59, Apt. 112, Tulsa, Okla. 74145, and Alvin S. Powell, 15300 E. Pine, Tulsa, Okla. 74116
Filed May 14, 1973, Ser. No. 360,128
Int. Cl. B62d *17/00*
U.S. Cl. 280—96.2 B **1 Claim**



1. In an automobile front end suspension system including a chassis forward cross-frame, a lower support arm and a pivot

bolt extending from the cross-frame, the pivot bolt extending perpendicular the longitudinal length of the cross-frame and being threaded at the outer end, the inner end of the lower support arm having an opening therethrough, the axis of said opening being perpendicular the longitudinal length of the lower support arm, improved means of adjustably pivotally supporting the lower support arm to the pivot bolt as a means of adjusting the front wheel camber, comprising:

a bushing having a cylindrical external surface rotatably received in said opening in the lower support arm, said bushing having a longitudinal opening therethrough, the axis of which is parallel the bushing cylindrical axis, the bushing opening being eccentric to the cylindrical exterior, the bushing receiving said pivot bolt by said longitudinal opening, the length of said bushing measured parallel the cylindrical axis being greater than the thickness of said lower support arm measured parallel the axis of said opening therethrough whereby a portion of said bushing extends exteriorly on both sides of said support arm, and wherein said bushing includes opposed wrench flats on the external cylindrical surface of said portion of said bushing extending exteriorly and rearwardly of said lower support arm, said flats serving as a means of rotatably positioning said bushing on said pivot bolt to thereby longitudinally position said lower support arm,

a nut threadably received on said threaded outer end of said pivot nut, said bolt when inwardly threadably advanced serving to directly clamp said bushing against said cross-frame to prevent the rotation thereof; and

a tubular bearing interposed between said bushing and said lower support arm opening.

3,866,939

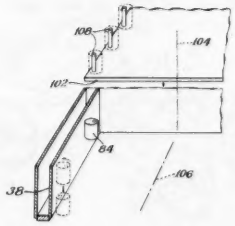
MOUNTING BLOCKS IN VEHICLE FRAME AND METHOD OF INSTALLATION THEREIN

Ronald J. Fanslow, Palatine, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 87,038, Nov. 5, 1970, Pat. No. 3,713,203. This application July 24, 1972, Ser. No. 274,140

Int. Cl. B62d *25/20*

U.S. Cl. 280—106 R **10 Claims**



1. A mounting block assembly for a vehicle frame, comprising:

a frame with inner walls defining a mouth;

a door received by the frame for being bolted thereto, and sized to cover the mouth of the inner frame walls;

door mounting blocks installed generally tangentially on the inner walls in juxtaposition behind the door, and being cylindrical with *r* radius; and

bolt openings presented by the blocks to receive door bolts, each having *e* eccentricity to the cylinder, and having the opening center with an offset of about *r* from the adjacent inner wall yet, during installation, affording selective offsets of the opening center approximately within the range $r + e$ to accommodate actual practice.

3,866,940

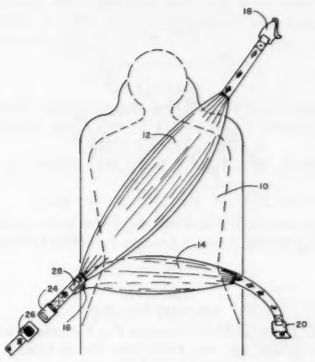
DIFFERENTIALLY INFLATABLE RESTRAINING BAND FOR VEHICLES

Donald Joseph Lewis, Troy, Mich., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed Jan. 11, 1973, Ser. No. 322,653

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 AB **2 Claims**



1. Inflatable restraining means for a vehicle safety system comprising a unitary inflatable member folded in uninflated condition to be in the form of a seat belt with frangible means ruptured on commencement of inflation to obtain full inflation thereof, said folded inflatable member comprised of a plurality of inflatable first sections integral therewith containing said frangible means connected by at least one uninflated intermediate section integral therewith, said first sections being inflatable to a cross-section greater than said uninflated intermediate section; said unitary member extending at uninflated sections to points of connection on the vehicle, said first inflatable sections in gas communication with one another via said intermediate section unitary therewith, said first inflatable sections comprise a lap and shoulder restraining portion, and the intermediate section secured to a portion of a buckle and containing said means for inflating said sections, and means for restricting radial expansion of said intermediate section, means capable of rupturing said frangible means on commencement of inflation of said member in response to a preselected condition of the vehicle.

3,866,941

Patent Not Issued For This Number

3,866,942

ROLLOVER PROTECTION APPARATUS

William J. Dobeus, Lake Forest; James V. Cheetham, Chicago; Daniel Pacheco, Libertyville; Carl A. Keyzer, Mundelein, and Don G. Sandrock, McHenry, all of Ill., assignors to Allis-Chalmers Construction Machinery Inc., Milwaukee, Wis.

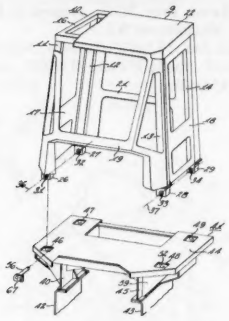
Filed Aug. 16, 1973, Ser. No. 388,974

Int. Cl. B62d *25/06*

U.S. Cl. 280—150 C **5 Claims**

3. Rollover protection apparatus for a vehicle having an operator's platform including a floor, said apparatus comprising: a plurality of openings in said floor, a rollover protection structure having a plurality of depending legs with bottom end portions extending into said openings, respectively, and means releasably connecting said bottom end portions to said platform below said floor, said means including an opening in

each of said end portions, vertical brackets secured to the underside of said floor and presenting aligned holes and pins



releasably mounted in said openings and holes, said brackets being integral with vertical bracing members for said floor.

3,866,943

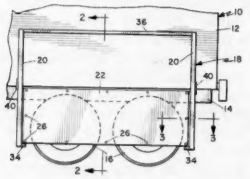
SPLASH GUARD

Pamela B. Innis, 2733 St. Laurent Pl., La Jolla, Calif. 92037

Filed Apr. 23, 1973, Ser. No. 353,565

Int. Cl. B62d *25/16*

U.S. Cl. 280—154.5 R **1 Claim**



1. A splash guard for a truck having at least one ground-contacting wheel and a body portion overhanging said wheel and a side of said body portion disposed above and outwardly of said wheel, said splash guard comprising:

two vertically spaced tracks mounted to and extending above and below the lowermost portion of said side;

a panel slideably received in said tracks and disposed outwardly of said wheel and substantially normal to the axis thereof and coextensive with a major portion of said wheel, whereby sidespray or swash created by the turning wheel on wet pavement is deterred from sidewise escapement;

said panel being capable of upward displacement in said tracks to permit access to said wheel for maintainance; and

a locking means whereby said panel can be established at any of a plurality of vertically spaced levels.

3,866,944

LOCKING DEVICE FOR SEAT BELT FOR VEHICLES

Kuniyuki Takahashi, Nogoya, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

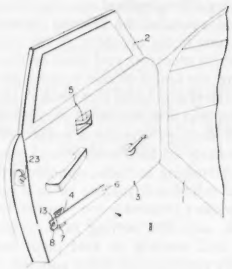
Filed May 3, 1973, Ser. No. 356,714

Claims priority, application Japan, May 10, 1972, 47-54443; May 26, 1972, 47-52860; May 26, 1972, 47-52861

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 SB **5 Claims**

1. A locking device for a seat belt releasably binding the body of the passenger to the seat in a vehicle having a striker mounted on the vehicle body comprising a seat belt retractor for releasably holding one end portion of said seat belt, said seat belt retractor including a shaft hving a retracting direction, an automatic locking wheel having a plurality of tooth portions and mounted firmly on said shaft, a locking lever pivoted at substantially the central portion thereof to the door by a pin and having an engaging end portion engageable with said tooth portions of said automatic locking wheel, a return spring associated with said locking lever for normally biasing



said engaging end portion of said locking lever toward said automatic locking wheel, a release lever engageable at one end portion thereof with the other end portion of said locking lever, a ratchet wheel rotatable in unitary relation with a latch wheel engageable with the striker mounted on the vehicle body, and a rod connecting the other end portion of said release lever to a portion of said ratchet wheel.

3,866,945

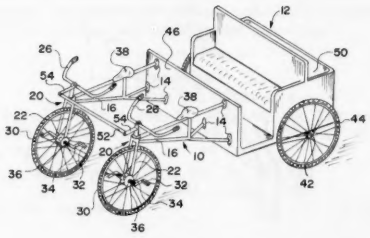
RECREATIONAL VEHICLE

John A. Bingham, 84-A Lakeview Dr., Whispering Pines, N.C. 28389

Filed May 22, 1973, Ser. No. 362,789

Int. Cl. B62k *5/04, 5/08, 19/46*

U.S. Cl. 280—202 **2 Claims**



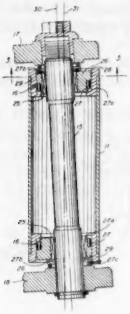
1. A recreational, multi-use vehicle comprising a drive section including a frame, a steering column pivotally mounted to the front end of said frame and a wheel rotatably mounted to the lower end of said steering column by means of an axle extending through said wheeel and rotatably supported by said lower end of the steering column, a drive means comprising pedals attached to the ends of said axle, said frame further including an upper horizontal bar and a lower horizontal bar extending rearwardly from said front end of the frame, said lower bar being bifurcated in the rear portion thereof to provide in combination with said upper bar a three-point first connector means at the terminal ends of said upper bar and said bifurcated lower bar, a wheeled carriage comprising a planar front wall, and means connecting said three-point connector means to said front wall.

3,866,946

MOTORCYCLE STEERING HEAD ANGLE ADJUSTMENT

Gary A. Robison, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada

Filed Oct. 11, 1973, Ser. No. 405,276
Claims priority, application Canada, Oct. 26, 1972, 154941
Int. Cl. B62k 19/00
U.S. Cl. 280—279 10 Claims



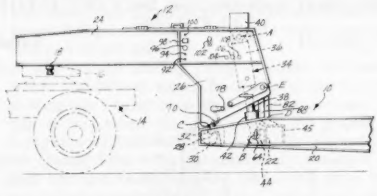
1. A mechanism for adjustment of the steering head angle of the front fork of a motorcycle, said mechanism comprising: a steering head spindle; two bearing means arranged at locations spaced longitudinally of the spindle, said bearing means mounting said spindle in a motorcycle frame for angular rotation about a generally upright axis in the central longitudinal vertical plane of the motorcycle; means coupling said front fork to said spindle in fixed relation thereto for rotation with said spindle; one of said bearing means including adjustment means operable to vary the angular position of said axis in said vertical plane thereby to vary the steering head angle of said front fork.

3,866,947

REMOVABLE GOOSENECK LOW BOY TRAILER

Michael J. Yakubow, Church Hill, Md., assignor to Centreville Tag-A-Long Trailers, Inc., Centreville, Md.

Filed Apr. 26, 1973, Ser. No. 354,752
Int. Cl. B62d 53/06
U.S. Cl. 280—425 A 12 Claims



1. In a trailer assembly including a trailer bed and a gooseneck, apparatus connecting one end of the trailer bed to the gooseneck, said apparatus comprising:

a. detachable coupling means interconnecting said trailer bed and said gooseneck at a first forward location at the one end of said trailer bed,

b. hydraulic ram means having a first end connected to said gooseneck at a second location spaced from said first location, and having a second force transmitting end,

c. bearing means on said trailer bed adapted to detachably engage the second end of said ram means so as to receive a thrust force imparted by said ram means, said bearing means being positioned at a third location spaced rearwardly of said coupling location, whereby said ram means and said coupling means provide a force couple for relative rotation of said gooseneck to said trailer bed,

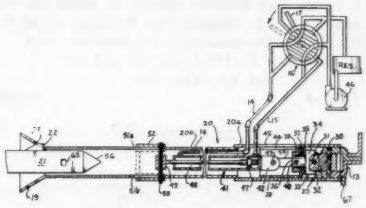
d. thrust block means, independent of said ram means, being movable between a first position where said thrust block means is interposed between a rear portion of said gooseneck and a bearing surface of said trailer bed positioned rearwardly of said coupling means so as to be loaded in compression thereby, and a second position where said thrust block means is out of thrust engagement between said trailer bed and said gooseneck to permit relative rotation of said gooseneck and trailer bed to lower the trailer bed.

3,866,948

COUPLING MECHANISM WITH LATCHING ALSO WITH RELATIVE UNIVERSAL MOVEMENT UNCOVERING BETWEEN OBJECTS

Gerald J. Crochet, Sr., 1000 Roselawn Dr., Lafayette, La. 70501

Filed Nov. 1, 1972, Ser. No. 302,862
Int. Cl. B62d 53/00
U.S. Cl. 280—478 R 10 Claims



1. A coupling mechanism for employment with two objects to be latched together for travel in tandem, said coupling mechanism including a projectable member, a universal joint assembly with respective members adapted to permit articulation, relative rocking vertically, and side sway or rotation about axis of travel, operating means to project said projectable member in one direction for an included connection means to effect latching between said objects and to move said projectable member in such relation to said universal joint assembly as to permit relative universal movement, between objects, said projectable member upon projection to another position by said operating means, transforming said universal joint assembly by engagement therewith to effectuate substantially rigid connection between said objects.

3,866,949

SAFETY COVER FOR A BUMPER HITCH

John R. Green, 1047 N. Estelle, Wichita, Kans. 67214

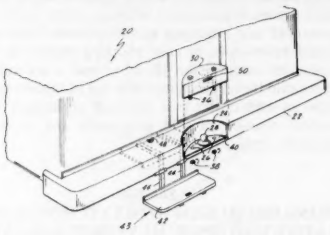
Filed July 16, 1973, Ser. No. 379,714
Int. Cl. B60d 1/06
U.S. Cl. 280—507 7 Claims

1. A safety cover for a bumper hitch connected to a bumper having an indented recess with an open top and an open front with said bumper hitch being positioned on the bottom of said recess, comprising:

a. a cover member to confine said bumper hitch,

b. means for stepping pivotally attached to said bumper in proximity to said recess and having means for securing said cover member when mounted on said bumper and pivoted to rest on said bumper comprising, a step plate member, at least one generally L-shaped support member, said L-shaped support member including a back having the upper most portion thereof pivotally connected to said bumper and a base abutting the centermost portion of said step plate member and connected to the bottom thereof, said step plate member having a portion

closely sheltering part of said cover member to hold said cover member in an encompassing position with respect to said recess when pivoted to rest on said bumper, and



c. said cover member including exterior surfaces that collimate and align with the exterior surfaces of said bumper when attached thereto.

3,866,950

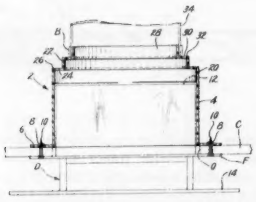
MULTI-SIZE ADAPTERS

Edward L. Skoch, East Meadow; Sigfried W. Anderson, Westbury, and Ronald R. Slogick, East Meadow, all of N.Y., assignors to Versatile Industries, Inc., Plainview, N.Y.

Filed May 21, 1973, Ser. No. 362,250

Int. Cl. F16l *35/00*

U.S. Cl. 285—4 **9 Claims**



1. A multi-size connector unit for use in air distribution systems, comprising: an adapter having an outlet end of generally rectangular, box-like configuration to receive an air diffuser, and having an inlet end including at least two axially extending wall sections of different size to fit ducts of corresponding size; a transverse wall connecting the lower end of the smaller section to the upper end of the larger section, said transverse wall having a groove formed therein at its juncture with the wall of said larger section to reduce the thickness of the transverse wall at said juncture to facilitate separation of the smaller section from the larger section by severing along said groove; and a bellows section comprising a series of interconnected convolutions generally V-shaped in radial cross-section disposed between the inlet end and the outlet end of the adapter

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3,866,951

COMBINATION SKID AND COUPLING ASSEMBLY

Wells D. DeLoach, 3353 Rio Bonito, Covina, Calif. 91722

Filed Sept. 17, 1973, Ser. No. 397,705

Int. Cl. B05b *15/00;* **F16l** *21/02*

U.S. Cl. 285—5 **2 Claims**

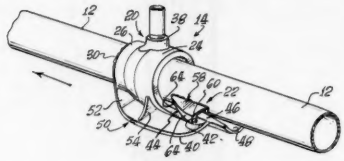
1. A combination skid and coupling assembly for joining adjacent pipe sections of an irrigation drag line comprising:

a pair of mating coupling parts including a coupling head and a coupling yoke each comprising an integral one-piece structure,

said coupling head including a tubular coupling body having a coupling nipple at one end for attachment to one pipe section and a coupling socket at the other end for removably receiving one end of the other pipe section, a generally semi-cylindrical cradle extending axially from the bottom of and beyond the latter end of said coupling head, and providing an upwardly opening trough for cradling said other pipe section, and a ground skid at the bottom of said coupling head having arcuate lateral extensions projecting beyond opposite sides of said body and cradle and curving upwardly toward each end of said coupling head,

the upper edges of said cradle being stepped to provide thrust shoulders spaced from and facing said coupling head and upwardly opening recesses between said head and thrust shoulders,

said coupling yoke including an arcuate band to fit about and be secured to said other pipe section, and coupling



lugs projecting radially outward from the ends of said band,

said coupling parts being adapted to be assembled in coupled relation, wherein said lugs are disposed in said cradle edge recesses with the normally lower surfaces of the lugs facing the cradle edges and one end of the lugs engaging said cradle thrust shoulders to interlock said parts against axial separation, and

the cradle edge portions in the regions between said thrust shoulders and the outer cradle end sloping downwardly toward said cradle end and said lower coupling lug surfaces sloping upwardly toward the opposite ends of the lugs and the radially outer edges of the lugs converging in the direction of said latter lug ends to guide said coupling parts into assembled relation.

3,866,952

JOINT STRUCTURE FOR STEEL PIPE PILES

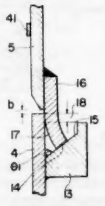
Jiro Inoue, Kamakura; Ken Takatori, Kawasaki, and Tsuyoshi Nakamata, Hiratsuka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1973, Ser. No. 360,929

Claims priority, application Japan, Dec. 9, 1972, 47-141578

Int. Cl. F16l *13/02*

U.S. Cl. 285—21 **6 Claims**



1. A joint structure for jointing upper and lower steel pipe pile pieces, comprising:

a stopper member secured to the inner periphery of said lower pipe pile piece below the joint end edge of said lower pipe pile piece, the upper surface of said stopper member having an angle of inclination of under 90° relative to the inner periphery of said lower pipe pile piece; and

a generally tubular joint metal piece secured to said upper pipe pile piece and projecting therefrom so as to be re-

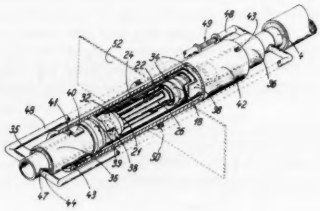
ceived within said lower pipe pile piece, the end of said joint metal piece remote from the end of said upper pipe pile piece being of reduced diameter relative to the remainder of said joint metal piece, the end face of said reduced diameter portion of said joint metal piece being formed with an inclined surface having an angle of inclination corresponding to said angle of inclination of said upper surface of said stopper member, so that said end face of said joint metal piece comes into close contact with said upper inclined surface of said stopper member when said upper and lower pipe pile pieces are joined.

3,866,953

AXIAL PIPE COMPENSATORS

Ove Thastrup, Fredericia, Denmark, assignor to A/S E. Rasmussen, Fredericia, Denmark

Filed Apr. 25, 1972, Ser. No. 247,331
Int. Cl. F16l *11/12*
U.S. Cl. 285—47 **7 Claims**



1. An axial compensator unit comprising:

a pair of end tubes axially spaced from one another, each one of said pair being adapted to be connected to respective end portions of longitudinally adjacent pipe sections, thereby joining said pipe sections together;

an expandable bellows means for absorbing axial expansion and contraction forces on said pipe sections, said bellows means being secured to said pair of end tubes between said pair of end tubes;

first and second guiding tubes disposed concentrically within said bellows means, each of said first and second guiding tubes being connected to respective ones of said pair of end tubes, said first and second guiding tubes being relatively movable with respect to one another;

third guiding tube means concentrically mounted within said first and second guiding tubes, said third guiding means being secured to one of said pair of end tubes and relatively movable with respect to the other of said pair of end tubes;

protective sleeve means of an elastomeric material for insulating said bellows means from moisture and corrosion, said protective sleeve means surrounding said bellows means and secured to said pair of end tubes;

an exterior protective means for absorbing external pressure on the unit, said exterior protective means surrounding said elastomeric sleeve means and said bellows means, and said exterior protective means connected to said pair of end tubes; and

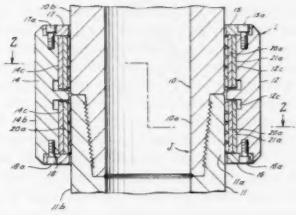
at least one holding means for holding the unit in a predetermined arrangement, said holding means being connected to said pair of end tubes.

3,866,954

JOINT LOCKING DEVICE

Damon T. Slator, and Archie W. Peil, both of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed June 18, 1973, Ser. No. 370,811
Int. Cl. F16l *35/00*
U.S. Cl. 285—82 **10 Claims**



1. A positive joint locking device for locking a threadedly connected joint of pipe or the like against threaded disengagement, comprising:

split housing sections for forming an annular assembly, each housing section having an inner curved surface for mounting about the ends of threadedly connected pipe or the like;

releasable attaching means for releasably attaching said split housing sections together about said threadedly connected pipe ends;

gripper means mounted with said split housing sections at the inner surface thereof for gripping said threadedly connected pipe ends to prevent disengagement of said pipe ends; and

wedge means for wedging said gripper means substantially radially inwardly relative to said inner surfaces of said housing sections in response to the exertion of lateral forces on said gripper means tending to move same laterally, which lateral forces are caused by forces tending to disengage said threaded connection between said pipe ends, said wedge means and gripper means cooperating to prevent threaded disengagement of said pipe ends.

3,866,955

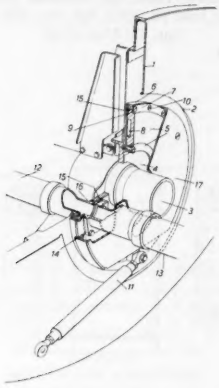
ROTARY COUPLINGS

Harry Maynard, Brough, and Roy Desmond Boot, Hull, both of England, assignors to Hawker Siddeley Aviation Limited, Surrey, England

Division of Ser. No. 187,083, Oct. 6, 1971, Pat. No. 3,755,626.
This application May 14, 1973, Ser. No. 359,631
Claims priority, application Great Britain, Oct. 6, 1970, 47499/70
Int. Cl. F16l *39/00*
U.S. Cl. 285—136 **4 Claims**

1. A rotary coupling, for the transfer of at least one liquid between relatively rotating assemblies, comprising an annular stator and a co-operating annular rotor, the stator and rotor being in mutual contiguity and concentric with the axis of relative rotation, and there being an annular channel in one providing fluid flow passage continuity between respective flow ports in the stator and rotor when relative rotation oc-

curs, and wherein the rotor is secured rigidly to the end of a rotating member and carries the stator mounted in a channel



in the rotor, the stator being held against rotation by a universally-jointed tie rod connection to fixed structure.

3,866,956

DEVICE FOR THE RELEASABLE FASTENING OF HOSE OR PIPE ENDS

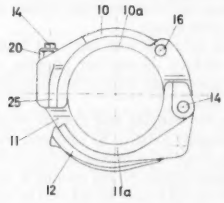
Karl Weinhold, Im Jagdfeld 43, 4040 Neuss, Germany

Filed Apr. 23, 1973, Ser. No. 353,627

Claims priority, application Germany, June 22, 1972, 2230464; Mar. 8, 1974, 2310681

Int. Cl. F16l *33/00*

U.S. Cl. 285—243 **23 Claims**



1. A device for releasably fastening of hose or pipe ends, comprising two half-shells; a lever operated fastener for closing said two half-shells at one end; and adjustable means for adjustably closing said two half-shells at the other end, said adjustable means comprising a pin pivotally mounted at one end on one of the half-shells and extending into a bore provided in the other half-shell, and means for retaining said pin in said bore.

3,866,957

PLUG ASSEMBLY

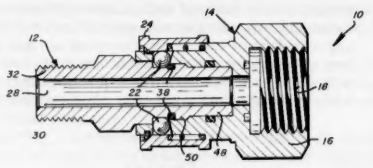
James F. Norton, Berea, Ohio, assignor to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Aug. 17, 1973, Ser. No. 389,166

Int. Cl. F16l *37/18*

U.S. Cl. 285—316 **3 Claims**

1. In a coupling for interconnecting fluid conduits and including a plug having a body and a socket assembly for receiving at least a portion of said plug body and having locking elements for engaging said plug to hold it against axial movement relative to said socket assembly, the improvement comprising ring means disposed on said plug body for abutting engagement with said locking elements, said ring means including an annular metal ring disposed in abutting engagement with said plug body and formed of a metal which is harder than the material forming said plug body, said ring



having a circular cross sectional configuration in a radially extending plane and an outer surface which is engaged by said locking elements when said plug body is received in said socket assembly.

3,866,958

FLUID TIGHT CONDUIT FASTENING SYSTEM

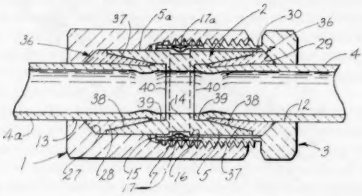
Harold Gold, 3645 Tolland Rd., Shaker Heights, Ohio 44122

Filed July 13, 1973, Ser. No. 379,199

Division of Ser. No. 124,741 Mar. 16, 1971, Pat. No. 3,746,376.

Int. Cl. F16l *19/00*

U.S. Cl. 285—334.2 **3 Claims**



1. The means for fastening a conduit having a flanged end in a fluid tight assembly comprising: said flanged end, a seat member, a first coupling member and a second coupling member; said seat member having coaxial end faces, one of said end faces mating in sealing relationship with the seal face of said flanged end, said first coupling member being adapted to engage said flanged end and said coupling members being mutually adapted to clamp said seat member against said sealing face of said flanged end:

a. said seat member being a cylinder coaxial with the axis of said end faces, said cylinder having a coaxial cylindrical groove spaced between said end faces by cylindrical lands;

b. said first coupling member being a screw member, said screw member having a coaxial tubular portion extending forward of the threads of said member, the bore of said tubular portion extending in said screw member and joining a smaller coaxial bore therin, the shoulder formed at the junction of said bores being adapted to engage said flanged end, a pair of diametrally opposite inward indentations being in the wall of said tubular portion, said indentations projecting into said cylindrical groove in said seat member to attach said seat member to said screw member;

c. the diametral distance between the innermost points of said indentations being less than the diameter of said lands but greater than the diameter of said groove, the diametral clearance between said lands and said bore of said tubular portion being sufficient to allow said tubular portion to ovalize when said indentations engage said lands thereby permitting the insertion of said seat member into said bore through the application of an axial force between said seat member and the screw member, the width of said groove being greater than the width of

said indentations, lateral and axial play being thereby provided in said attachment; and,

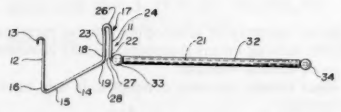
d. said second coupling member being a body having a threaded bore that mates with said screw member and having an internal shoulder that mates in sealing relationship with the second of said end faces of said seat member.

3,866,959

WHIP FINISHING TOOL

Frank W. Matarelli, 4426 Irving St., San Francisco, Calif. 94122

Filed May 8, 1974, Ser. No. 468,030
Int. Cl. D03j *3/00*
U.S. Cl. 289—17 **10 Claims**



1. A whip finishing tool comprising:

a rigid slender element having a first substantially straight free end portion with a hook formed at its free end;

a substantially straight first intermediate portion having one end connected to and extending laterally from the opposite end of said first end portion;

a second U-shaped intermediate portion having one end connected to the opposite end of said first intermediate portion and extending laterally therefrom in the direction of said first end portion; and

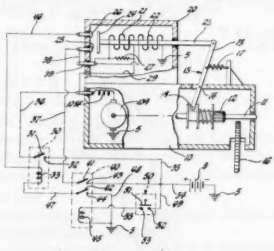
a manually engageable substantially straight second end portion connected to the opposite end of said second intermediate portion and extending therefrom in a direction away from said first intermediate portion.

3,866,960

INTERNAL COMBUSTION ENGINE CRANKING MOTOR ENERGIZING CIRCUIT

Satish M. Chohan, Bolingbrook, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1974, Ser. No. 439,287
Int. Cl. H02p *9/04*
U.S. Cl. 290—38 **7 Claims**



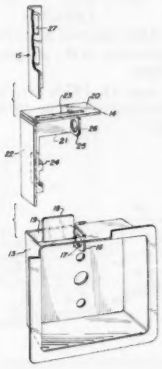
1. An internal combustion engine cranking motor energizing circuit comprising in combination with a cranking system including an electric cranking motor having an extended shaft, a pinion gear slidably mounted upon and rotated by the extended motor shaft and a shift mechanism operable to axially slide the pinion gear in one direction to engge and in an opposite direction to disengage the pinion gear and the cranking gear of the associated internal combustion engine and a source of direct current potential: an electrical solenoid having a pull-in coil connected in series with said cranking motor, a hold-in coil, an armature member in operative engagement with said shift mechanism which is operated to a first position by a spring and to a second position upon the energization of said pull-in and hold-in coils to effect, respectively, the disengagement and engagement of said pinion and engine cranking gears, an electrically conductive member carried by said armature and a pair of electrical contacts bridged by said electrically conductive member when said armature is operated to said second position; a resistor connected in parallel across said pull-in coil; an electrical switching device of the type having normally open current carrying elements operable to the electrical circuit closed condition in response to an electrical signal; means for connecting said current carrying elements of said electrical switching device and said cranking motor in series across said source of direct current potential; a relay having two movable and stationary contact pairs and an operating coil; an energizing circuit including one of said movable and stationary contact pairs of said second relay for each said pull-in coil and parallel connected resistor and said cranking motor in series and said hold-in winding; an electrical circuit including said same one movable and stationary contact pair of said second relay, said pair of electrical contacts of said solenoid and the other said movable and stationary contact pair of said second relay through which an electrical signal may be supplied to said electrical switching device; an electric crank switch; and an energizing circuit including said electric crank switch for said operating coil of said second relay.

3,866,961

RECESSED LOCKING MECHANISM

Herbert A. List, Flossmoor, Ill., assignor to List Industries, Incorporated, Harvey, Ill.

Filed Sept. 4, 1973, Ser. No. 394,296
Int. Cl. E05b *65/44*
U.S. Cl. 292—336.3 **5 Claims**



1. In a storage locker, a locking mechanism operable to latch and unlatch the locker door comprising:

a pan extending rearwardly from the surface of the door and having its open front portion in the plane of the surface of said locker door, said pan including an opening in one of its sides:

guide means projecting outwardly from a location adjacent to said opening;

a bracket covering said opening and movable on said guide means by a force directed through said opening wherein said opening is of sufficient size so that said force can be generated directly on said bracket by the fingers of a hand;

latching means responsive to the movement of said bracket; and

locking means located within the recessed portion of said pan capable by itself or in combination with a removable lock of fixing said bracket in a locked position.

3,866,962

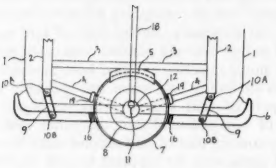
LATERAL MOTION BUMPER SYSTEM

Cheston Lee Eshelman, 621 N.E. 30th Ter., Miami, Fla. 33137

Continuation-in-part of Ser. No. 325,822, Jan. 22, 1973,. This application Sept. 24, 1973, Ser. No. 400,225

Int. Cl. B60r *19/10;* **B61f** *19/04;* **B61g** *11/08*

U.S. Cl. 293—19 **7 Claims**



1. A lateral motion bumper system for a motor vehicle having a frame comprising, a bumper rail mounted on a longitudinal extremity of said frame transversely thereof, a wheel and inflated tire horizontally positioned and partially surrounded by said bumper rail, stop members for bearing against said tire and said frame, and hinge means connecting said bumper rail and said frame so that when said bumper rail strikes an obstruction before it, the rail will be moved transversely and longitudinally of the vehicle to strongly thrust the wheel and tire against the stop members.

3,866,963

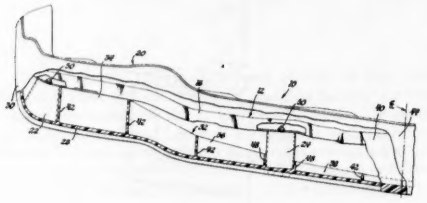
ENERGY ABSORBING BUMPER ASSEMBLY

Peter A. Weller, Durham, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Aug. 13, 1973, Ser. No. 388,025

Int. Cl. B60r *19/08*

U.S. Cl. 293—88 **27 Claims**



1. An energy absorbing bumper assembly comprising: a mounting means adapted for attachment to a vehicle, an elongated shell disposed adjacent said mounting means, first bumper means disposed between said mounting means and said shell for absorbing a first quantity of energy, and second bumper means disposed between said mounting means and said shell for absorbing a second quantity of energy, said second quantity of energy being different than said first quantity, said first and second bumper means being spaced longitudinally along said shell, said first bumper means including a plurality of spaced blocks of elastomeric material, said shell having a varying configuration therealong and said second bumper means varies in configuration longitudinally along said shell.

3,866,964

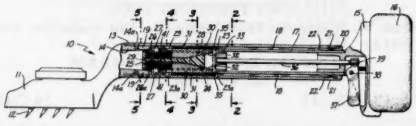
CARPET STRETCHER WITH TELESCOPING TUBING LOCKING DEVICE

Earle F. Prater, Long Beach, Calif., assignor to Roberts Consolidated Industries, Inc., City of Industry, Calif.

Filed Dec. 26, 1973, Ser. No. 427,578

Int. Cl. A47g *27/04*

U.S. Cl. 294—8.6 **7 Claims**



1. In an assembly of telescoping tubular members having releasable locking means therebetween, the combination of:

an outer tubular member;

an inner tubular member concentric in said outer tubular member;

a pair of shoe members in said outer tubular member and radially movable therein into and out of engagement with the inner wall of said outer tubular member;

wedge means extending between said shoe members and longitudinally movable with respect thereto in one direction to move said shoe members radially outwardly into locking engagement with said outer tubular member and in an opposite direction to permit said shoe members to move radially inwardly out of locking engagement with said outer tubular member;

connecting means connecting said wedge means and said inner tubular member so that longitudinal movement of said inner tubular member in said one direction similarly moves said wedge means in said one direction and movement of said inner tubular member in said opposite direction permits movement of said wedge means in said opposite direction; and

release means connected to said shoe members, independent of said connecting means and movable to move said shoe members in said one direction and out of locking engagement with said wedge means.

3,866,965

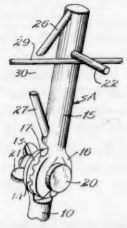
HOT STICK ATTACHMENT

Howard A. Homeier, 625 1st. St., Kenyon, Minn. 55496

Filed Jan. 14, 1974, Ser. No. 433,073

Int. Cl. A47f *13/06*

U.S. Cl. 294—19 R **7 Claims**



1. An attachment for the upper end of a hot stick including: a first arm projecting radially from the attachment on a first plane through the axis of the attachment,

a pair of inclined arms projecting from the hot stick attachment on a second plane through the axis of said attachment in angularly spaced relation from said first plane,

said second arms including a first arm projecting in outwardly and downwardly extending relation and a second

arm in outwardly and upwardly inclined relation from said attachment to terminate in spaced relation to provide a gap between the extremities of said inclined arms,

said gap being slightly below a third plane substantially normal to the axis of said attachment and through the axis of said radially projecting first arm, whereby

said hot stick may be rested against wire to be engaged with said first arm above said wire and the attachment may be lowered until the radial first arm rests upon the wire, and the hot stick may be turned about its axis until said wire extends through said gap.

3,866,966

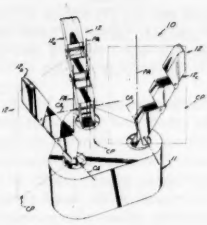
MULTIPLE PREHENSION MANIPULATOR

Frank R. Skinner, II, 2248 Ann Dr., St. Joseph, Mich.

Division of Ser. No. 360,022, May 14, 1973, abandoned. This application Mar. 5, 1974, Ser. No. 448,342

Int. Cl. A61f *1/06*

U.S. Cl. 294—106 **9 Claims**



1. A multiple prehension manipulator mechanism comprising:

a plurality of finger means;

finger drive means for selectively opening and closing said finger means to grasp; and,

positioning drive means for selectively positioning said finger means so that at least two of said finger means are aligned along a common path in direct opposition to each other at a first position, and are parallel to each other and laterally spaced from each other in a second position.

3,866,967

TRUCK AIR FOILS

Robert G. Landry, 45 Rachel Blvd., Lewiston, Maine 04240, and Sherman R. Jenney, 27 Rochelle St., Auburn, Maine 04210

Filed Oct. 16, 1973, Ser. No. 407,029

Int. Cl. B60j *9/04*

U.S. Cl. 296—1 S **9 Claims**

1. A truck air foil mounted on the front surface of a box thereof, and the like, comprising:

A. a generally triangular shaped air foil including:

i. a substantially rectangularly shaped solid top portion;

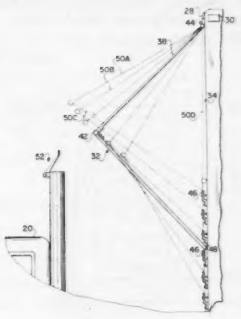
ii. a substantially rectangularly shaped solid bottom portion; and

iii. means hingedly and adjustably interconnecting said top and bottom portions;

B. a mounting means for said air foil including:

i. means connecting said air foil to said box by attaching a hinge to said box and to said substantially rectangularly shaped top portion on its free edge opposite the edge hingedly and adjustably interconnecting said top and bottom portions; and,

ii. a plurality of parrallel vertically spaced positioning brackets on said surface of said box hingedly and adjustably connecting the substantially rectangularly shaped bottom portion to said box by engaging the free edge of said bottom portion opposite the edge hingedly and adjustably interconnecting said top and bottom portions, whereby the angular configuration and position of said air foil can be adjustably varied by selectively connecting said free edge of said bottom portion



to different positioning brackets on said box, and whereby said airfoils are capable of movement to a stored inoperative position with respect to said box to minimize overall box dimentions.

3,866,968

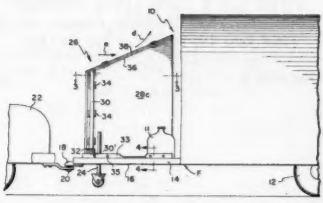
DRAG REDUCING APPARATUS FOR A TRAILER

Jack R. Donahue, Vaughn Trailer Park, Box 45, Care Mich. 48723

Filed Sept. 27, 1973, Ser. No. 401,369

Int. Cl. B62d *37/02*

U.S. Cl. 296—1 S **6 Claims**



1. Drag reducing apparatus for detachably mounting on the front of a trailer and the like comprising:

a pair of side walls each having an upwardly, rearwardly inclined upper edge portion;

means swingably connecting said side walls for movement between rearwardly diverging, operative positions and inoperative, folded positions;

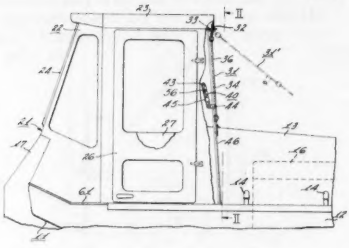
a top wall; and

means mounting said top wall on one of said side walls for swinging movement between an upwardly inclined position in which it spans the inclined upper edge portions of said side walls when said side walls are in said operative positions, and a position extending alongside at least one of said side walls when said side walls are in said inoperative positions so that said apparatus can be removed and folded for storage.

3,866,969
OPERATOR'S COMPARTMENT WITH SWINGING WINDOW

Don G. Sandrock, McHenry, and Roy E. Kline, Wadsworth, both of Ill., assignors to Fiat-Allis Construction Machinery, Inc., Milwaukee, Wis.

Filed Aug. 16, 1973, Ser. No. 388,973
Int. Cl. B60j *1/00*; B62d *33/06*
U.S. Cl. 296—28 C 7 Claims



1. An operator's compartment for a motor vehicle of the type having a removable engine hood, said compartment comprising:

a basic structure including a top and side walls,

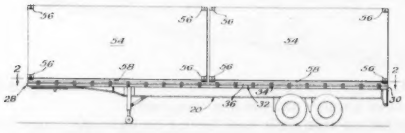
a window panel structure pivotally connected near its top to said basic structure for outward and upward swinging movement about a transverse axis between closed and open positions and having a bottom sealing edge adapted to sealingly engage the top of said hood, and

side panels releasably secured to said basic structure having laterally inward seal edges adapted to sealingly engage opposite sides, respectively, of said hood and having top portions in lapped engagement with laterally spaced bottom portions of said window panel structure when the latter is in its closed position, said side panels being laterally adjustable relative to said basic structure.

3,866,970
TWIST LOCK CONTAINER SUPPORT

Phillip D. Schwiebert, 599 Greenleaf, Glencoe, Ill. 60022

Filed June 19, 1972, Ser. No. 263,981
Int. Cl. B60p *1/64*; B65j *1/22*
U.S. Cl. 296—35 A 16 Claims



1. An improved twist lock container support which is adapted to be attached to a trailer for transporting freight containers and which is adapted to secure a conventional, twist lock corner fitting of a freight container to the trailer during transport, the improved container support comprising:

a platform including a first aperture therein having a generally vertical axis and including first detent means on the lower surface thereof, with the first detent means being spaced from and about said vertical axis of the first aperture;

means for mounting the platform to a structural member of the trailer, adjacent to the periphery of the trailer, and for positioning the platform in a first position wherein the platform is disposed in a generally horizontal plane defined by the bottom surface of the freight containers transported on the trailer;

a locking cone which is carried by the platform and which includes a head portion that projects upwardly above the upper surface of the platform and a shaft portion that is connected at one end to the head portion and that extends through the first aperture in the platform such that its other end is below the lower surface of the platform, the head portion of the locking cone being adapted to be rotatably moved, about said vertical axis and with respect to the platform, between a first position wherein the head portion can be received within the aperture of the corner fitting of a freight container positioned on the trailer such that the corner fitting rests on the upper surface of the platform and a second position wherein the head portion secures the corner fitting and the container support;

an operating handle, disposed below the plane of the platform, having its one end projecting from said vertical axis toward the periphery of the trailer so that the one end can be grasped by a person actuating the container support and having its other end projecting inwardly beyond said vertical axis;

means for connecting the operating handle, intermediate its ends, with the othehr end of the shaft portion of the cone so that rotational movement of the operating handle, about said vertical axis and in a plane substantially parallel to said horizontal plane, results in a corresponding rotational movement of the head portion of the cone, with the connection means also permitting limited vertical pivotal movement of the handle with respect to the shaft portion of the cone;

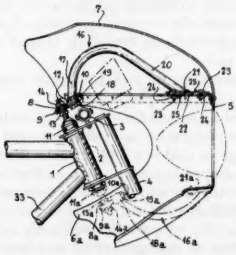
second detent means carried by the operating handle between the connection means and the one end of the operating handle, such that the second detent means may selectively cooperate with the first detent means; and

means for resiliently biasing the operating handle so that the second detent means is normally biased upwardly against the lower surface of the platform, the biasing means including a spring disposed between the other end of the operating handle ad the lower surface of the platform and normally biasing the other end of the operating handle downwardly away from the lower surface of the platform.

3,866,971
MEANS FOR FASTENING A DRIVER PROTECTION SCREEN ON THE FRONT OF A MOTORCYCLE FRAME

Daniel Hugon, 38 Rue Pasteur, Moirans-En-Montagne, France

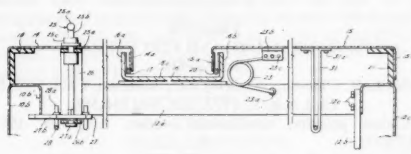
Filed May 17, 1973, Ser. No. 361,206
Claims priority, application France, Dec. 8, 1972, 72.44436
Int. Cl. B62j *17/00*
U.S. Cl. 296—78.1 10 Claims



1. Fastening for a driver protection screen to the front of a motorcycle frame having a pivot shaft for handle bars, com-

prising: a pivot connection fixed to the screen and consisting of a pivot element fixed to move intergrally with the handle bars and disposed coaxially to their pivot shaft to support and orient the screen axially in the plane of symmetry of the motorcycle frame, and at least one brace fastening the screen to the motorcycle frame and locking it transversely in relation thereto in such position that the planes of symmetry of the said screen and frame remain at least approximately in coincidence regardless of the angular position of the handle bars relative to the frame; the pivot connection consisting of a swivel whose pivot forms a ring provided with a spherical peripheral bearing which is blocked on the pivot shaft about which the handle bars pivot on the frame; and the pivot being completed by a coaxial bolt designed to replace on the threaded end of the pivot shaft of the handle bars the bolt which normally retains it axially in the sleeve of the frame acting as a bearer therefor.

3,866,972
TRUCK BED COVER ASSEMBLY
Murray C. Reese, 3046 Golfcrest, Houston, Tex. 77017
Filed Feb. 28, 1973, Ser. No. 336,850
Int. Cl. B60j *7/10*
U.S. Cl. 296—137 B **8 Claims**



1. A flush-fitted cover apparatus for the bed of a pick-up truck or the like wherein said bed in formed of an upstanding front wall, upstanding side walls, a floor and a pivotally mounted rear gate, comprising:

a frame assembly adapted for mounting inside said bed, said frame assembly including, front and rear frame members having mounted therewith a central frame member positioned between said upstanding bed side walls;

a pair of cover panels and hinge means mounting said cover panels onto said central frame member for movement between closed and open positions;

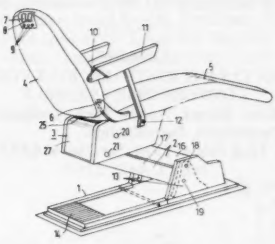
each of said cover panels extending outwardly over said upstanding bed side walls with said cover panels in said closed position;

a lock means mounted with each of said cover panels for locking said cover panels in said closed position, each of said lock means including lock rods that, in a locked position, lockingly engage under said front and rear frame members to lock said cover panels in said closed position; and

said central frame member being U-shaped in cross-section and including a horizontal base and opposed, facing vertical sides extending upwardly from the base;

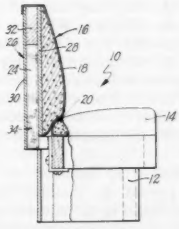
said hinge means including first and second hinge assemblies respectively mounted to the inward facing portions of said vertical sides and to said cover panels whereby said cover panels are independently mounted onto said central frame member and respectively extend over said vertical sides when in the closed position to substantially prevent water leakage between said cover panels.

3,866,973
DENTAL PATIENTS CHAIR WITH AUTOMATIC ACTUATION
Erich Heubeck, Bensheim, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Oct. 17, 1973, Ser. No. 407,258
Claims priority, application Germany, Oct. 21, 1972, 2251737
Int. Cl. A61g *15/00*
U.S. Cl. 297—316 **8 Claims**



1. A dental patients' chair, comprising a chair upper part having an adjustable seat and an adjustable back, a carrier supporting said upper part, a base, a parallelogram carrying arm connected with said carrier and said base for adjusting the height of said upper part, devices for shifting said seat and said back, an electrical actuating device for said shifting devices, said actuating device comprising a rotary potentiometer constituting an actual value transmitter and having an axle and a key finger connected with said axle, said finger having a free end engaging the part of said parallelogram arm connected with said carrier and changing its position when the height position of the seat is changed for the purpose of detecting the change of the seat position relatively to the base, a value transmitter, a setting member connected with the last-mentioned transmitter to preset a selected position for the seat and a supporting part arranged on said carrier and carrying the last-mentioned transmitter and said setting member.

3,866,974
BENCH SEAT
Ferris E. Jones, 943 Millbury, La Puente, Calif. 91744
Filed June 25, 1973, Ser. No. 373,111
Int. Cl. A47c *7/40*
U.S. Cl. 297—353 **6 Claims**



1. A bench seat comprising: a seat frame, a seat member supported on said frame, a backrest member at the rear of said seat member, and means supporting said backrest member on said frame for vertical movement between a lower position of use wherein the lower edge of said backrest member is disposed in close proximity to the rear edge of said seat member and an elevated cleaning position wherein a relatively wide clearance space exists between the lower edge of the backrest

member and the rear edge of the seat member to facilitate cleaning of the bench seat

said bench seat having an angular L-shaped configuration, with said backrest member having angularly disposed portions to support a plurality of occupants, and said backrest portions are integrally joined for movement in unison between said use and cleaning positions,

said backrest member is removable from said frame by elevation of said latter member above said elevated cleaning position, and

said bench seat includes means for releasibly latching said backrest member in said elevated cleaning position.

3,866,975

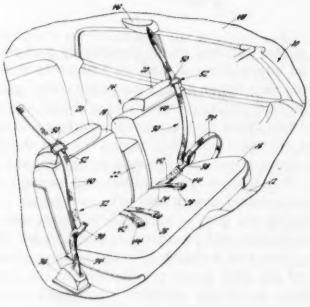
VEHICLE OCCUPANT RESTRAINT BELT SYSTEM WITH COMFORT CLIP ASSEMBLY

John J. Fricko, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1974, Ser. No. 439,893

Int. Cl. A62b *35/00*

U.S. Cl. 297—388 **3 Claims**



1. In an automotive vehicle including an occupant seat having cushion and back portions, a restraint belt system for a seated occupant comprising:

lap and shoulder belts, a common first buckle component secured to adjacent first ends of the lap and shoulder belts, a second buckle component for selectively attaching the first buckle component so as to secure the belts in an occupant restraining position, the lap belt extending generally laterally with respect to the vehicle across the occupant's lap while in the restraining position, and the shoulder belt extending diagonally across the occupant's chest while in the restraining position;

means attaching the other end of the lap belt so as to secure the lap belt in the occupant restraining position;

an inertia locking type belt retractor receiving the other end of the shoulder belt so as to normally tension the shoulder belt across the chest of the belted occupant and to store the shoulder belt upon detachment of the buckle components;

a stop through which the shoulder belt passes, the stop being located toward the shoulder belt retractor with respect to the shoulder of the belted occupant over which the shoulder belt passes while extending diagonally across the occupant's chest in the restraining position, and the stop allowing the shoulder belt to be freely pulled in either direction therethrough so that the shoulder belt is not impeded thereby during movement to the restraining position and does not, in and of itself, prevent the shoulder belt retractor from tensioning the shoulder belt across the occupant's chest; and

a plastic comfort clip assembly positioned on the shoulder belt between the first buckle component and the stop, the comfort clip assembly being of a two-piece construction including

an integral plastic comfort clip having a generally planar base that extends between the opposite edges of the shoulder belt in a generally parallel relationship with respect to the plane of this belt and having a pair of clamping portions integrally supported by the base so as to extend about the edges of the belt back toward each other and to terminate short of each other in a manner that defines a slot extending parallel to the longitudinal axis of the belt, and

an integral plastic retainer having a generally planar base located between the clamping portions of the clip and the shoulder belt so as to close the clip slot and to thereby prevent an intermediate portion of the shoulder belt from moving back through the slot after insertion thereof into the clip through the slot such that the clip assembly is thereby held on the shoulder belt,

the base and the clamping portions of the clip cooperating to clamp the shoulder belt therebetween with a force that is not so large as to prevent the clip assembly from being readily slid along the shoulder belt by a manual effort to provide adjustment thereof, the clamping force being sufficiently large to prevent the shoulder belt retractor from pulling the shoulder belt through the clip assembly, and the clip assembly engaging the stop to prevent movement therethrough so that appropriate manual adjustment of the clip assembly along the shoulder belt will prevent the shoulder belt retractor from tensioning the shoulder belt across the occupant's chest while in the restraining position.

3,866,976

SITTING FURNITURE AND STRUCTURAL UNITS THEREFOR

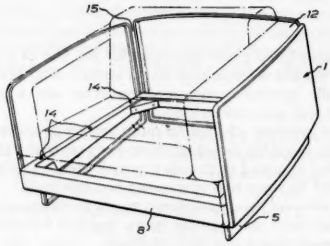
Folke E. H. Ohlsson, 302 Selby Ln., Atherton, Calif. 94025

Filed Aug. 8, 1973, Ser. No. 386,500

Claims priority, application Sweden, Aug. 10, 1972, 10370/72

Int. Cl. A47c *7/00*

U.S. Cl. 297—445 **6 Claims**



1. A structural unit for use in a piece of sitting furniture as back rest and lateral parts, comprising three integrally formed panel sections, viz, an upper panel section having substantially rectangular outline, an intermediate shelf panel section protruding at substantially right angles from said upper panel section and having substantially the outline of an isosceles trapezoid, the long base of which is the merging line between said intermediate shelf panel section and said upper panel section, and the non-parallel sides of which form an angle of substantially 45° with the long base of the isosceles trapezoid, and a lower panel section having substantially rectangular outline and protruding at substantially right angles from said intermediate shelf panel section, the merging line between said intermediate shelf panel section and said lower panel section forming one of the long sides of the rectangular outline of said lower panel section and the short base of the isosceles trapezoid outline of said intermediate shelf panel section, means on said lower panel section for supporting the struc-

tural unit on the floor, and connecting means on said shelf panel section for fastening a seat frame on said shelf panel section.

3,866,977

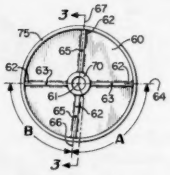
SUPPRESSION OF VIBRATION IN ROTATING DISCS

James E. Rice, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 254,022, May 17, 1972, Pat. No. 3,794,384. This application Jan. 28, 1974, Ser. No. 437,104

Int. Cl. B60b *3/04, 19/00*

U.S. Cl. 301—5 R 11 Claims



1. The method of suppressing plate mode structural vibration of a disc rotating about an axis comprising supporting said disc by a plurality of pairs of vibration suppressing members fixed on said disc and extending inwardly of the circumference thereof, each respective member of each said pair thereof being disposed in diametrally balancing relation with the other member of such pair, and spacing said pairs of members at unequal angular intervals such that any interval differs from the next interval by at least 5°.

3,866,978

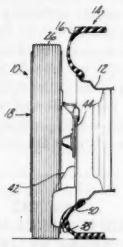
AUXILIARY WHEEL

Maynard W. Fine, 7178 Stonebrook Rd., West Bloomfield, Mich.

Filed Apr. 17, 1973, Ser. No. 351,961

Int. Cl. B60c *17/04*

U.S. Cl. 301—39 T 10 Claims



1. An auxiliary wheel for use with a conventional pneumatic tired wheel of a vehicle when the pneumatic tire carried by the rim of the conventional wheel is inoperative, said auxiliary wheel comprising;

a circular rim member having an outer diameter greater than the rim of said conventional wheel;

a tire carried on the outer peripheral surface of said circular rim member;

structural support means interconnecting portions of the inner periphery of said circular rim member;

a coupling member having attaching means for releasably attaching said member having a portion thereof arranged to extend radially beyond said attaching means;

means pivotally connecting said extended coupling member portion to said circular rim member, said circular rim member being in a non-coaxial position with respect to said wheel rim when said coupling member is attached thereto, said rim member being movable from said non-coaxial position to a coaxial position with respect to said wheel rim when said wheel is rotated a limited distance.

3,866,979

FAIL SAFE VEHICLE WHEEL BRAKING ANTI-LOCK SYSTEM

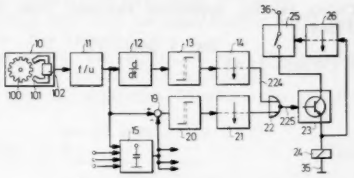
Friedrich Rabus, Schwieberdingen; Bernd Peter, Kornwestheim, and Hermann Eisele, Ditzingen, all of Germany, assignors to Robert Bosch GmbH, Gerlingen, Germany

Filed June 4, 1973, Ser. No. 366,691

Claims priority, application Germany, June 9, 1972, 2228104

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 AF 16 Claims



1. In a vehicle wheel anti-lock system in which fluid pressure applied to a vehicle wheel brake is relieved, having a solenoid (24) to operate a bleed valve, and means (10, 11) providing a signal representative of wheel speed;

differentiating means (12) delivering a differentiated derivative signal representative of rate of change of wheel speed;

threshold switch means (13) having the differentiated speed signal applied thereto and providing a pressure relief control signal to the solenoid when the differentiated signal exceeds a predetermined limit;

valve switching means (23) responsive to the pressure relief control signal to control energization of the bleed valve solenoid;

a first timing circuit means (14, 21) interposed between the threshold switch means (13) and the bleed valve switching means (23) and energized upon beginning of the pressure relief signal to start measuring a predetermined time interval and to conduct said pressure relief signal to the bleed valve switching means (23) during said time interval only to permit response of the solenoid coil to relieve brake pressure, said timing circuit means (13), after said predetermined time interval, interrupting application of said pressure relief signal to the valve switching means (23) regardless of persistence or non-persistence of the pressure relief signal, whereby control of relief of braking pressure by said pressure relief signal is limited to said time interval, and the time of relief of fluid pressure applied to the brake is always limited to said predetermined time interval;

and an additional turn-off circuit (26) including a turn-off relay (25, 251) connected between the power supply (35, 36) and said bleed valve solenoid (24) to interrupt current to the solenoid upon response of said turn-off circuit when energized, said turn-off circuit comprising

a solenoid condition sensing circuit (27) connected to provide a signal when current flows through the solenoid to operate said solenoid;

a turn-off timing circuit (28) having a second timing period longer than the timing period of the first timing circuit (14);

a logic gate (**29**) connected to the sensing circuit (**27**) and to the turn-off timing circuit (**28**) and providing an output upon logical conjunction of:

a. current flow to the solenoid, and

b. elapse of said second timing period,

the output of said logic gate being connected to said turn-off control relay (**25, 251**) to interrupt power to the solenoid upon response of said logic circuit after elapse of the second timing period of said turn-off timing circuit (**28**).

3,866,980

BRAKE ANTI-LOCK TEST SYSTEM

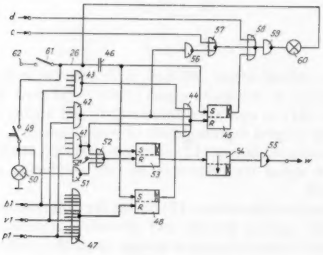
Hermann Eisele, Ditzingen; Harald Kizler, Schwieberdingen; Ardelio Gualco, Schwieberdingen; Friedrich Rabus, Schwieberdingen; Peter Jurgen Schmidt, Schwieberdingen, Germany; Johannes Locher, and Wolfgang Misch, both of Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 28, 1973, Ser. No. 374,306

Claims priority, application Germany, June 29, 1972, 2231864

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 AF **27 Claims**



1. Test system to test operational reliability of a vehicle wheel brake anti-lock system having a pressure fluid operated brake, a pressure relief valve (**14**) in the pressure fluid line to the brake, controlled switching means (**38**) controlling operation of said relief valve (**14**), and a wheel acceleration sensing means (**29**) having means (**32, 33**) generating a deceleration signal (b1) connected to and controlling operation of the controlled switch means (**38**) when a predetermined level of wheel deceleration is sensed, said test and monitor system comprising

a pressure switch (**25**) connected to be responsive to fluid pressure in the respective wheel brake cylinder (**16**) and providing a pressure signal (p1);

electrical means (**54**) generating a simulated wheel deceleration signal (w) connected to the deceleration signal generating means (**32, 33**);

a test indicator (**60**);

a logic circuit (**44**) having said deceleration signal (b1) and said pressure signal (*p*1) applied thereto and logically combining said signals to provide an output signal indicative of presence of the pressure signal (*p*1) and the wheel deceleration signal (*b*1);

and controlled switch means (**45**) connected to said indicator, and being controlled to set to "test" state upon energization of the controlled switching means, said controlled switch means being further connected to and controlled by the output of said logic circuit (**44**) to reset in response to an output from said logic circuit (**44**).

3,866,981

ANTISKID VEHICLE BRAKE SYSTEM FOR INDIVIDUAL WHEEL CONTROL

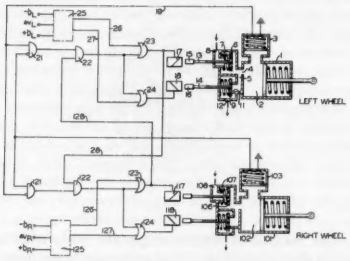
Alfred Klatt, Ronnenberg, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed Mar. 27, 1974, Ser. No. 455,246

Claims priority, application Germany, June 29, 1973, 2333125

Int. Cl. B06t *8/12*

U.S. Cl. 303—21 A **5 Claims**



1. An antiskid control system for fluid pressure actuated brakes of a vehicle having a pair of independently rotatable wheels on a common axle of the vehicle, each wheel having monitoring means for generating a plurality of wheel behavior signals according to the dynamic conditions of that wheel and evaluation means controlled by said wheel behavior signals for effecting operation of modulator valve means disposed in the brake line connecting an operator controlled foot valve device to a brake cylinder of the wheel being monitored so as to adjust that wheel brake pressure, wherein the improvement comprises control circuit means for effecting operation of said modulator valve means in parallel with the evaluation means, said control circuit means including means for providing a brake pressure signal indicative of the wheel brake pressure being above or below a preselected value, said brake pressure signal of either one of the wheels being connected to said control circuit means of the other wheel to effect operation of the modulator valve means thereof when the brake pressure of the one wheel is below said preselected value and the brake pressure of the other wheel is above said preselected value.

3,866,982

FAILSAFE ANTISKID CONTROL FOR FLUID PRESSURE BRAKE SYSTEM

Georg Geier, Hannover, and Alfred Klatt, Ronnenberg, both of Germany, assignors to Wabco Westinghouse GmbH, Hannover, Germany

Filed Mar. 27, 1974, Ser. No. 455,248

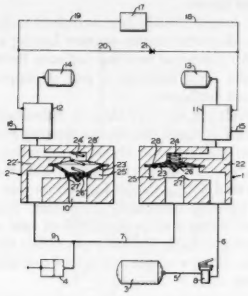
Claims priority, application Germany, June 18, 1973, 2331003

Int. Cl. B60t *8/02*

U.S. Cl. 303—21 F **5 Claims**

1. A vehicle antiskid brake control system of the type having wheel monitoring means for producing output signals according to the dynamic behavior of the wheel, a first one of said output signals being connectable with an inlet modulator valve and a second one of said output signals being conectable with an outlet modulator valve to control operation thereof for effecting adjustment of the wheel brake pressure during a cycle of wheel skid control, wherein the improvement com-

prises means for connecting said second output signal to said inlet valve in parallel with said first output signal to effect



operation of said inlet valve when said outlet valve is operated in the absence of said first output signal.

3,866,983

ANTI-SKID DEVICE FOR AUTOMOTIVE VEHICLES

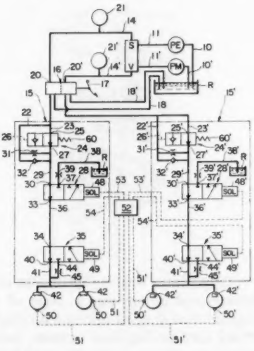
Toshiyuki Kondo, Toyota, Japan, assignor to Aisin Seiki kabushiki Kaisha, Kariya City, Japan

Filed May 22, 1974, Ser. No. 472,502

Claims priority, application Japan, June 1, 1973, 48-61692

Int. Cl. B60t *8/02*

U.S. Cl. 303—21 F **6 Claims**



1. An anti-skid braking system for at least one wheel of a vehicle, comprising

a hydraulic fluid reservoir,

a hydraulic pressure pump having an inlet and an outlet, said inlet communicating with said reservoir,

a pressure operated brake,

conduit means connecting the outlet of said hydraulic pump to said pressure operated brake,

normally closed control valve means disposed in said conduit means, said normally closed control valve means being operatively connected with a brake pedal for selectively controlling said control valve means to control the flow of fluid through said conduit means,

pressure controlled valve means disposed in said conduit means, said pressure controlled valve means including,

means defining a first path from said hydraulic pressure pump to said pressure operated brake,

a throttle in said first path,

means defining a second path in parallel with said first path,

a valve member in said second path,

a control gate communicating with said pressure operated brake and responsive to the braking pressure to close said valve member and block said second path when the braking pressure exceeds a predetermined threshold value so that only available brake pressure applying path is said first path through said throttle, and

pressure discharging means including,

an alectronic anti-skid control device sensitive to the dynamic state of said wheel, said electronic anti-skid control device being operatively connected with said pressure discharging means to actuate said pressure discharging means during a wheel braking operation in response to the dynamic state of the wheel being braked to selectively release the braking pressure being applied to said pressure operated brake to prevent a vehicle skidding condition from arising.

3,866,984

LOAD-DEPENDENT BRAKE FORCE DISTRIBUTOR WITH A FAILSAFE BYPASS VALVE

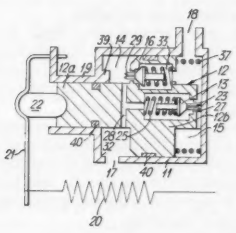
Hermann Seip, bad Vilbel, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Division of Ser. No. 301,040, Oct. 26, 1972. This application Jan. 14, 1974, Ser. No. 434,451

Claims priority, application Germany, Nov. 9, 1971. 2155706

Int. Cl. B60t *8/18, 11/34*

U.S. Cl. 303—22 R **4 Claims**



1. A load-dependent brake force distributor connected between a master cylinder and wheel brake cylinders comprising:

a cylinder;

a stepped piston disposed in a longitudinal slidable sealed relation in said cylinder;

an input pressure medium chamber formed between one end of said cylinder and one side of said stepped piston; an output pressure medium chamber formed between the other end of said cylinder and the other side of said stepped piston;

a first valve disposed concentrically of said stepped piston to connect said input chamber to said output chamber in its open position;

a first arrangement connected to said stepped piston responsive to a load-dependent control force to open and close said first valve; and

a second arrangement associated with and actuated by said cylinder to provide a direct connection between said input chamber and said output chamber when said control force fails;

said cylinder having a first diameter and including

a cylindrical projection extending therefrom having a second diameter less than said first diameter;

said stepped piston including

a first portion spaced from said cylindrical projection having a third diameter less than said first diameter,

a second portion adjacent said cylindrical projection having a fourth diameter equal to said first diameter, and

a third portion having a fifth diameter equal to said second diameter slidably sealed to the inner surface of said cylindrical projection;

said first arrangement including

a traction spring exerting a force dependent upon said load,

a bar connected at one end to said cylindrical projection and at the other end to said traction spring, and

a push rod connected between said bar and said third portion of said stepped piston;

said cylinder including

a transverse closing wall spaced from the adjacent end of said first portion of said stepped piston;

said first and second portions of said stepped piston including

a cavity disposed concentrically of the longitudinal axis of said stepped piston,

an aperture at each end of said cavity, one of said apertures communicating with said input chamber and the other of said apertures communicating with said output chamber,

said first valve being disposed within said cavity, and

a valve spring disposed about said valve within said cavity to assist in the control of said first valve;

said first valve including

a pin projecting from one end thereof through said other of said apertures, said pin abutting said closing wall and opening said first valve against the force of said valve spring when a predetermined amount of said control force is applied to said third portion of said stepped piston;

said second arrangement including

a normally closed second valve which is opened when said control force fails by the movement of said stepped piston away from said closing wall to cause said cylinder to engage and open said second valve;

said cylindrical projection including

a projection parallel to the longitudinal axis of said stepped piston extending into said input chamber; and said second valve is disposed in said second portion of said stepped piston parallel to said longitudinal axis thereof in alignment with said projection;

said second valve including

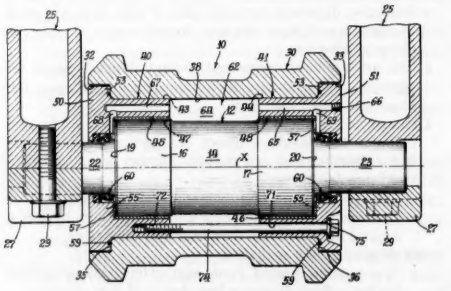
a tappet extending therefrom to engage said projection to open said second valve upon failure of said control force.

3,866,985

TRACK ROLLER

Gerald E. Whitehurst, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 4, 1974, Ser. No. 447,986
Int. Cl. F16c *13/02*
U.S. Cl. 308—20 **6 Claims**



1. A track roller for rotation about a predetermined axis comprising;

a cylindrical rim concentric to said axis and including a pair of opposed, axially spaced end faces and a longitudinal, centrally disposed bore formed therethrough transpiercing said end faces;

an elongated, longitudinally disposed shaft including a relatively large diameter center portion having a pair of axially spaced cylindrical bearing surfaces formed thereon and opposite ends defining a pair of opposed, axially spaced thrust surfaces;

a pair of cylindrical retainer sleeves individually positionable in axially spaced, radially supporting relation within said bore of said rim and about a respective one of said bearing surfaces of said shaft, each of said retainer sleeves being provided with a flange formed on one end thereof having a radially outwardly extending flange portion positionable along a respective one of said end faces of said rim and a radially inwardly extending flange portion positionable along a respective one of said thrust surfaces of said shaft; and

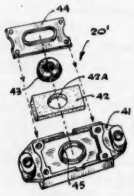
tie means extendible between said retainer sleeves axially to clamp said outwardly extending flange portions of said retainer sleeves against the opposed end faces of said rim to secure said rim and said retainer sleeves in unitary assembly about said shaft.

3,866,986

RESILIENT SPHEROIDAL BEARING SUPPORTS

Frank Holper, Cary, Ill., assignor to Original Equipment Motors Inc., Crystal Lake, Ill.

Filed Oct. 5, 1973, Ser. No. 404,378
Int. Cl. F16c *23/04, 23/10, 27/06*
U.S. Cl. 308—72 **6 Claims**



1. A spring retainer for a bearing having an axial bore and a spherical surface and comprising a plate of spring metal having an elongated oval-shaped opening formed in the plane thereof, the metal surrounding said opening being bent outwardly to present a continuous collar-like wall having opposite sides convergent toward one another outwardly of said opening, said wall having a free edge and the spaced portions of said free edge corresponding to said opposite sides being substantially parallel to one another and spaced from one another a distance sufficient to enable the bearing to be disposed therein with the spherical surface of the bearing captured by the convergent sides of said wall.

3,866,987

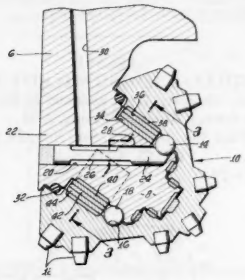
DRILL BIT WITH LAMINATED FRICTION BEARING

Lloyd L. Garner, Los Alamitos, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jan. 14, 1974, Ser. No. 433,068
Int. Cl. F16c *19/00*
U.S. Cl. 308—8.2 **9 Claims**

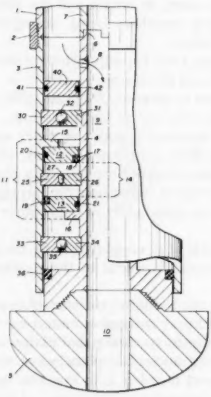
1. A bearing assembly for a drill bit having a leg journal and a rotary cutter thereon, the leg journal and cutter having concentric opposed surfaces of revolution comprising bearing surfaces, wherein the improvement comprises: at least a pair of concentric friction bearing rings, one ring comprising an

inner ring in rotary sliding contact with the leg journal bearing surface, an outer ring in rotary sliding contact with the rotary



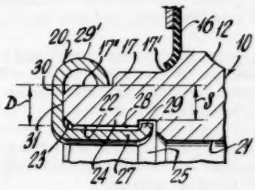
cutter bearing surface, and said concentric rings being in frictional engagement and rotatable relative to each other.

3,866,988
BEARING SYSTEM
John H. Striegler, Richardson, Tex., assignor to Atlantic Richfield Company, New York, N.Y.
Filed Feb. 26, 1973, Ser. No. 335,539
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.1 **11 Claims**



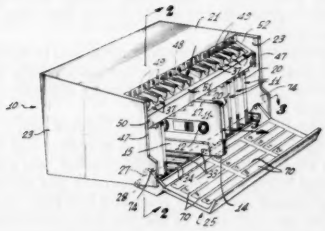
1. In a well drilling tool whereby a drill bit is rotated in the earth on a downhole motor shaft means to drill a wellbore, a housing carried concentric with said shaft and spaced therefrom thereby providing an annular chamber between said housing and shaft, the improvement comprising at least one liquid thrust bearing means operably connected between said housing and shaft in said annular chamber, said at least one liquid bearing means comprising at least one first seal means, at least one second seal means, said first and second seal means being spaced apart to define an inner chamber therebetween, said first seal means coacting with one of said housing and shaft, said second seal means coacting with whichever of said housing and shaft said first seal means does not coact with, whereby a force can be transmitted between said housing and shaft by way of said first and second seal means and through said inner chamber, and said first and second seal means are adapted to keep a liquid within said inner chamber.

3,866,989
LOCKING DEVICE FOR A BEARING
Howell L. Potter, New Britain, Conn., assignor to Textron Inc., Providence, R.I.
Division of Ser. No. 194,676, Nov. 1, 1971, Pat. No. 3,792,880.
This application Aug. 1, 1973, Ser. No. 384,833
Int. Cl. F16c *33/30*
U.S. Cl. 308—236 **19 Claims**



1. In an antifriction bearing, inner and outer ring components having opposed raceways and coaxially spaced by antifriction elements in said raceways, one of said ring components having inner and outer cylindrical surfaces one of which is sized to fit a given cylindrical mounting profile, said one ring component having an annular axially extending end portion projecting in axially offset relation to a body portion containing the raceway of said one ring component, said end portion extending radially between spaced geometric cylinders containing said inner and outer cylindrical surfaces, said end portion adjacent said one surface being relieved over a limited arcuate extent about an axis eccentric to the axis of said one surface, said end portion including circumferentially extending radial flange means defining an axially inner retaining wall portion, and clip means comprising a generally C-shaped stiffly compliant metal ribbon engaging over the axially outer end of said flange means at a limited location thereof, said clip means including a tongue of thickness less than the maximum extent of eccentric relief and of arcuate extent substantially less than said limited arcuate extent, said tongue projecting axially inwardly within the relief region of said one ring component, said clip means being limited to substantially said limited angular location, and a radially projecting integral flange portion on said tongue extending into retaining radial overlap with the axially inner wall portion of said flange means.

3,866,990
STORAGE AND DISPENSING CABINET
William P. McRae, 19969 Acre St., Northridge, Calif. 91324
Filed Oct. 18, 1973, Ser. No. 407,751
Int. Cl. A47b *81/06*
U.S. Cl. 312—15 **14 Claims**



1. A storage and dispensing cabinet for generally rectangular tape cassettes of predetermined length, width and thick-

ness, each having a recess in a predetermined position on one longitudinal edge, said cabinet comprising:

a one-piece, box-like plastic case having upright side walls, open front and rear sides, a top wall having a front edge spaced rearwardly from said front side, and a bottom wall that converges forwardly toward said top wall;

said front side being spaced from said rear side a distance greater than the length of the tape cassettes, and said top wall being spaced from said bottom wall a distance substantially greater than the width of the cassettes;

a rear wall snap-fitted onto said case and closing said rear side;

supporting means for said case beneath said bottom wall for holding the case on a horizontal surface with said top wall substantially horizontal and said bottom wall inclined upwardly toward said front side;

a plurality of laterally spaced, parallel ribs on said bottom wall extending from adjacent said rear wall to adjacent said front side, and defining between them a plurality of slideways for tape cassettes;

a stop rib projecting forwardly from said rear wall for positioning engagement with tape cassettes on said slideways, said rib being spaced from said front side a distance approximately the same as the length of the cassettes;

a plurality of elongated, one-piece, molded plastic key levers disposed in side-by-side relation in said case beneath said top wall and having front end portions projecting forwardly beyond said top wall, and rear end portions terminating short of said rear wall, each of said key levers being vertically aligned with one of said slideways in a generally horizontally idle position, and having a transverse hole between its ends that is aligned with the holes in the other key levers;

a first elongated pivot rod extending generally horizontally through said holes and secured at its ends to said side walls;

a plurality of one-piece, L-shaped molded plastic ejector cranks disposed in side-by-side relation in said case beneath said top wall, each of said ejector cranks having an upper generally horizontal leg with a front end portion overlying the rear end portion of one of said key levers, a generally vertical leg extending downwardly along said rear wall in alignment with one of said slideways to lie behind a tape cassette engaging said stop rib, and a transverse hole therethrough adjacent the juncture of said legs and aligned with the holes in the other ejector cranks;

a second elongated pivot rod extending generally horizontally through said holes and secured at its ends to said side walls;

said key levers having upwardly projecting fingers adjacent their rear ends in free sliding engagement with the undersides of said generally horizontal legs, and downwardly projecting fingers adjacent their rear ends positioned for detenting engagement with the recesses in the cassettes;

a depending flange formed integrally with the front edge of said top wall and terminating in a lower edge adjacent the tops of said key levers and spaced rearwardly from the front ends thereof, said flange having laterally spaced zones aligned with the key levers for displaying identifying indicia;

an elongated crossbar extending across said front side along said front ends of said key levers and covering the lower portions thereof, said crossbar being integrally joined at its ends to said side walls;

an elongated flat plate disposed beneath said front end portions and integrally joined at its ends to said side walls and along its front edge to said crossbar, said plate being spaced below said front end portions and having a rear edge spaced rearwardly from said first pivot rod for engaging the undersides of said key levers to determine the idle positions thereof, while permitting upward rocking of said rear end portions in response to depression of said front end portions;

and a cover door overlying said open front side and hingedly connected to said case adjacent said bottom wall to swing forwardly and downwardly into an open position in which the cover projects forwardly from the case, the inner side of said cover door having a plurality of identifying plates thereon for information correlating said key levers with the cassettes stored in said cabinet.

3,866,991

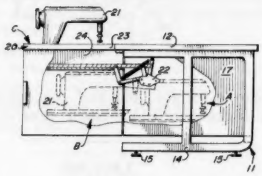
CANTILEVER SEWING MACHINE TABLE

Harry Wener, Phoenix, Ariz., assignor to Inc. International Education Sewing Manual, Phoenix, Ariz.

Filed Jan. 16, 1973, Ser. No. 324,137

Int. Cl. A47b *81/00*

U.S. Cl. 312—29 **1 Claim**



1. A cantilever type sewing machine table comprising in combination:

a pair of upstanding spaced U-shaped leg members,

each of said U-shaped leg members comprising a pair of legs horizontally arranged and facing in the same direction,

one of said legs of each of said members arranged to support a table top along its length and the other of said legs of each of said members being arranged for positioning along the floor,

an overhanging table top supported on said one of said legs of each of said members,

a compartment suspended from said table top between said members at one end of said table top,

a drophead machine support member supported on said table top within said compartment, said drophead machine support member comprising a platen and a sewing machine support telescopically arranged for relative movement longitudinally of each other a predetermined amount,

said sewing machine support moving on said platen a distance substantially equal to the overhang of said table top, and

clamping means mounted on said platen for cooperating with a fixed part thereof mounted on the under side of said table top for securing said platen and said table top in a common horizontal plane when said drophead machine support member is in machine operative position.

3,866,992

WRITING UTENSIL

Otto Katz, Schwabach, Germany, assignor to A. W. Faber-Castell, Stein bei Nurnberg, Germany

Filed Nov. 13, 1973, Ser. No. 415,385

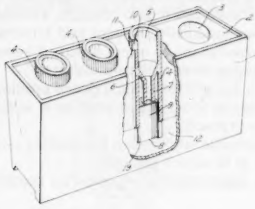
Claims priority, application Germany, Nov. 15, 1972, 2255943

Int. Cl. A47f *7/00*

U.S. Cl. 211—69.5 **9 Claims**

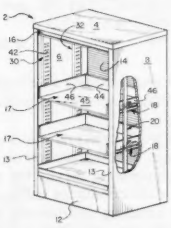
1. In a writing utensil, a combination comprising a writing instrument having a barrel and a writing tip which is to be kept moist; a moistening receptacle adapted to contain a liquid and having a normally upwardly facing open side, a cover on said open side and provided with a hole, a tubular insert received in said hole and having a larger-diameter axially outer tubular portion having an inner open end, and an open-ended smaller-diameter axially inner tubular portion located within said axially outer tubular portion and extending from a region

intermediate said hole and said inner open end towards but short of the latter, and a terminal insert partly received in said inner open end in abutment with said axially inner tubular portion and provided with a plurality of capillaries through which liquid can pass from the interior of said receptacle so that, when said writing tip is received in said tubular portion,



the writing tip will remain moist; and cooperating sealing surfaces on said barrel rearwardly of said writing tip and in said tubular insert at said region, said sealing surfaces engaging one another when said writing instrument is inserted into said tubular insert so as to seal the interior of said receptacle against the ambient atmosphere.

3,866,993
CABINET INTERLOCK MECHANISM
Carl J. Dean, Charlton; David M. Wright, Shrewsbury, and Bernard T. Cournoyer, Holden, all of Mass., assignors to Barry Wright Corporation, Watertown, Mass.
Filed Sept. 27, 1973, Ser. No. 401,385
Int. Cl. E05b *65/46*
U.S. Cl. 312—216 **7 Claims**

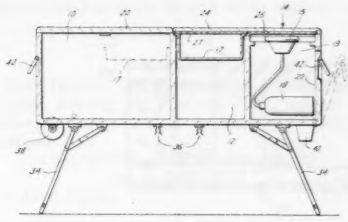


1. In a filing cabinet containing at least two pull-out storage components, apparatus for maintaining prescribed ones of said components in retracted position when a selected one of said components is pulled out to an extended position, comprising:

a slidable locking bar assembly spanning said pull-out components, said locking bar assembly comprising a locking bar, at least two locking pins, one for each of said pull-out components, and lock means releasably securing said locking pins to said locking bar, said locking pins being moveable lengthwise of said locking bar when said lock means are released, said locking pins projecting laterally of said locking bar into adjacent relation with said pull-out components, and

cam means mounted on each of said pull-out components in position to engage the adjacent locking pin, said cam means each comprising a first portion for engaging and camming the adjacent locking pin so as to move said locking bar in a first direction from a first unlocking position to a second locking position when the pull-out component on which said cam means is mounted is pulled out to an open position, and a second portion for engaging said adjacent locking pin so as to prevent the pulling out of the pull-out component on which said cam means is mounted when said locking bar has been moved to said second locking position by the camming action of another of said cam means on another of said locking pins.

3,866,994
CAMPING UNIT
Tracy Earl Bonin, Rt. 1, Box 321-C, Conroe, Tex. 77301
Filed Dec. 14, 1973, Ser. No. 424,909
Int. Cl. A47b *77/08*
U.S. Cl. 312—236 **6 Claims**



1. A camping unit comprising,

an insulated body having bottom, end wall and side wall body members,

a first partition in the insulated body spaced from one of the end wall body members forming a first compartment,

a second partition in the insulated body spaced from the other of the end wall body members and the first partition forming a second compartment between the first and second partitions and a third compartment between the second partition and the other of the end wall body members,

the first, second and third compartments adapted for use as an ice chest, a storage compartment and a stove compartment,

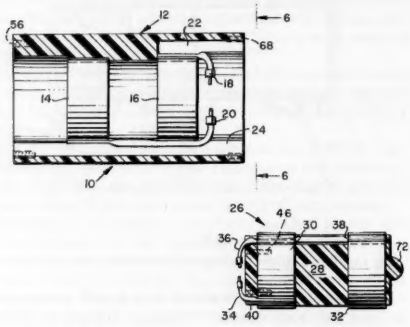
a third partition in the insulated body forming with at least one of the body members a water compartment, the third partition forming a wall of the compartment used as the ice chest, the ice chest having a wall forming at least a portion of a wall of the storage compartment whereby water in the water compartment is cooled by ice in the ice chest and the cooled water assists in maintaining a cool temperature in the storage compartment, and

lids on the insulated body closing the providing access to at least the compartments used as the ice chest and the storage compartment.

3,866,995
ROTATABLE ELECTRIC CONNECTOR
Louis Campo, 99 Waverly Ave., Patchogue, N.Y. 11772
Filed June 26, 1973, Ser. No. 373,857
Int. Cl. H01r *39/00*
U.S. Cl. 339—8 R **6 Claims**

1. A rotatable electrical connector comprising, in combination, a shell-shaped member of electrically insulating material; a plurality of electrically conductive rings attached to the internal wall of said shell-shaped member in spaced relationship from each other; a core-shaped member of electrically insulating material and rotatable within said shell member, said core-shaped member being supported by said shell-shaped member on the interior of said shell-shaped member; a plurality of conductive rings mounted in spaced relationship on the external surface of said core-shaped member, each ring on said core-shaped member being in electrical contact with one ring attached to said shell-shaped member; a first plurality of conductors connected to said conductive rings on said shell-shaped member; and a second plurality of conductors connected to said conductive rings on said core-shaped member, so that electrical current applied to said first plurality of conductors is transmitted to said second plurality of conduc-

tors through said conductive rings while said core-shaped member is rotating with respect to said shell-shaped member and when said core-shaped member is stationary with respect to said shell-shaped member, said shell-shaped member and said core-shaped member being of cylindrical shape, said conductive rings on said shell-shaped member and said core-shaped member being spaced along the axes of said cylindrical shell-shaped member and core-shaped member; a cover member attached to one end of said shell-shaped member, said first



plurality of conductors being attached to said cover member; a first cap member attached to one end of said core-shaped member, said second plurality of conductors being attached to said cap member; a second cap member abutting said first cap member and fastened to said shell-shaped member for covering the ends of said second plurality of conductors; and a third cap member attached to said shell-shaped member for covering the ends of said first plurality of conductors, said third cap member abutting said cover member.

3,866,996

MULTI-CONDUCTOR CONNECTOR APPARATUS FOR TELEPHONE AND OTHER DATA TRANSMISSION SYSTEMS

Luejene Elkins, Chicago, Ill., assignor to Bunker Ramo Corporation, Oakbrook, Ill.

Filed Oct. 16, 1972, Ser. No. 297,713

Int. Cl. H01r *11/20*

U.S. Cl. 339—99 R **9 Claims**

1. Connector apparatus for rapidly and interchangeably connecting an electrical data handling instrument to a data transmission system for communication with other data handling instruments connected in the system, said connector apparatus comprising:

a single-instrument fixed connector station comprising:

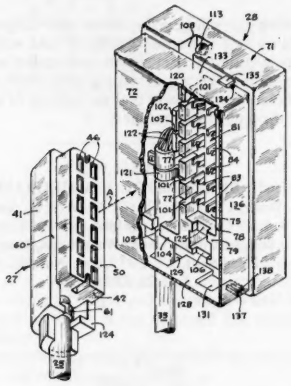
an insulator base including a cover receiving outer surface; a first terminal block disposed within said surface; a plurality of bifurcated front-engagement quick-connection contacts mounted in said first terminal block and projecting outwardly thereof in a predetermined pattern including at least one longitudinally extending row, each contact including bifurcations to penetrate the insulation on a single communication conductor outwardly of said base and to complete an electrical connection thereto upon insertion of the conductor between the bifurcations of the contact; first cable mounting means within said surface for mounting the end portion of a multiple-conductor cable, comprising a part of said data-transmission system, on said insulator base, laterally spaced from and adjacent said terminal block and into electrical connection with one of said front-engagement contacts;

said base including within said surface, a wall between said cable mounting means and said terminal block with a plurality of outwardly open slots for insertion of said conductors to said contacts, a connector receiving slot longitudinally adjacent said terminal block, and a polarized shape to orient a mating connector for mating engagement with said contacts,

a cover, movable between a closed position covering said receptacle and an open position in which said receptacle is exposed;

and releasable latch means for latching said cover on said base in its closed position;

and an instrument cable connector comprising:



a connector housing including a second terminal block of polarized configuration corresponding to said polarized shape;

a plurality of female contacts mounted in said second terminal block, in said predetermined pattern; and second cable-mounting means for mounting the end portion of a multi-conductor cable, comprising a part of said data-handling instrument, in said connector housing, said housing affording a covered wiring channel to permit connection of each conductor from said cable to the inner end of one of said female contacts; said cable connector being directly mountable on said base of said fixed connector station with said cover in its open position, with said second terminal block extending into said polarized shape and said female contacts of said cable connector receiving said bifurcations of said front engagement contacts to interconnect the individual conductors of the two cables in accordance with said predetermined pattern.

3,866,997

PRINTED CIRCUIT BOARD CONNECTOR AND METHOD AND TOOL FOR REMOVING CONTACTS THEREFROM

Erich Kreutter, Winterbach, and Hans Lindner, Rohrbronn, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,593

Claims priority, application Germany, Dec. 6, 1972, 2259774

Int. Cl. H01r *9/08*

U.S. Cl. 339—217 S **7 Claims**

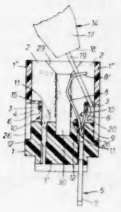
1. A printed circuit board connector comprising:

an insulated housing member having a bottom, a pair of spaced side walls extending upwardly from said bottom

and plurality of contact chambers formed along at least one of said side walls above said bottom;

a slot in said housing member between said side walls communicating with said contact chambers and adapted to slidably receive a printed circuit board therein;

a longitudinally extending bridge member in each of said contact chambers, said bridge member in each said chamber being spaced from said one side wall and said bottom



and defining a first upwardly extending opening and a second opening extending away from said bottom and bounded by said one side wall and said bridge member extending inwardly toward said slot from said one side wall and bounded by said bottom and said bridge member; and

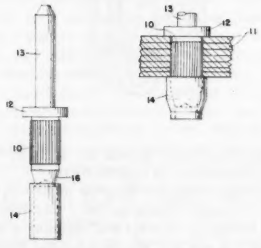
a plurality of contact receiving holes in said bottom located on the side of said bridge member opposite to said one side wall.

3,866,998

CONDUCTIVE TERMINAL FOR FLEXIBLE CIRCUIT BOARDS

James Iantorno, Mamaroneck, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,964
Int. Cl. H01r *9/08*
U.S. Cl. 339—220 R **8 Claims**



1. A conductive metal terminal for mounting within a hole formed in an insulator comprising an integral construction of:

a cylindrical shaft for mounting within said hole formed in the insulator and extending beyond one side thereof;

a shoulder formed integrally with one end of said shaft for limiting against the other side of the insulator;

a terminal post, for connection to a circuit component, formed integrally with the shoulder and extending in axial alignment with said shaft;

a spreader cone formed integrally with the opposite end of said shaft, said spreader cone being of a truncated conical configuration with its greater diameter end formed integrally with the shaft and being substantially equal in diameter with the diameter of said shaft, while the opposite end of said spreader cone is of smaller diameter than the diameter of said shaft; and

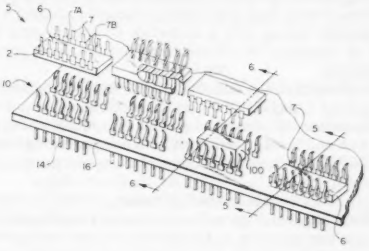
a hollow cylindrical ferrule integrally formed with said spreader cone and connected to the smaller diameter portion of said spreader cone, with the outer diameter of said hollow ferrule being substantially equal to the diameter of the shaft and the larger diameter of the spreader cone, while the internal diameter of said hollow ferrule is substantially equal to the smaller diameter of said spreader cone, such that the integral portion of the terminal connecting said spreader cone to the hollow ferrule defines a diminished shear section whereby, after said shaft is inserted into the hole and said shoulder abuts the insulator, an axial mechanical force may be applied to the terminal to cause shearing of the diminished shear section and radial expansion of the ferrule as it is forced over the spreader cone so as to form a pressure contact for mounting the terminal within the hole of the insulator.

3,866,999

ELECTRONIC MICROELEMENT ASSEMBLY

John Joseph Doherty, Jr., Franklin, Mass., assignor to IFE Division of Plastic Mold & Engineering Company, East Providence, R.I.

Filed Nov. 16, 1973, Ser. No. 416,420
Int. Cl. H05k *1/04*
U.S. Cl. 339—17 CF **5 Claims**



1. An electronic microelement assembly comprising an electronic microelement having a body with two opposite parallel sides, a plurality of terminals extending from one of said parallel sides, an equal number of a plurality of terminals extending from the other of said two parallel sides, the terminals on one side being aligned with the terminals in the opposite parallel side to form pairs of terminals, all of said terminals projecting in one direction and each of said terminals having a tongue profecting from a base, a circuit board having an upper surface which said microelement body overlies, a bottom surface, and a plurality of connectors carried by the circuit board in insulated relation to one another, said connectors arranged in two parallel rows with the connectors in one row aligned with the connectors in the other of said two parallel rows to form pairs of connectors, said assembly being characterized by each of said connectors:

A. having an anchoring part anchored in the circuit board;

B. having a receptacle end that projects generally upward from said upper surface and which

1. is grooved to define a slot which has substantially constant width along its length and having a back and two opposite sides, and in which the outer portion of a terminal is closely received by said back and two opposite sides;

2. has its groove sinuously curved so that the tongue is housed in said groove; and

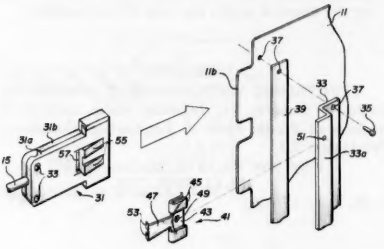
C. each of said connectors having a contact part which projects from said bottom surface of said circuit board for connection with other conductors,

D. in assembled relation, said pairs of terminals engaging said pairs of connectors to resiliently urge said pairs of connectors away from each other.

3,867,000
LATCHING SPRING CLIP DEVICE FOR SECURING ELECTRICAL CABLE CONNECTORS TO PRINTED WIRING CARDS

Bogumil M. Michalak, Melrose Park, and Ansano Bertellotti, Addison, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 10, 1973, Ser. No. 396,021
Int. Cl. H05k *1/02*
U.S. Cl. 339—17 L **5 Claims**



1. Apparatus for securing an electrical cable connector to a printed wiring card, said cable connector including a housing slidably mating with a connector on said printed wiring card to complete an electrical connection, said apparatus comprising:

a latching device mounted on said printed wiring card comprising a single flat spring member extending outwardly therefrom in substantial parallel spaced alignment therewith and having a pair of spaced tabs extending normally therefrom toward said connector on said printed wiring card;

a pair of inclined riders on said housing ending at respective back edges and spaced to correspond to said spaced tabs, said tabs engaging said inclined riders and sliding thereon as said housing is mated with said connector on said printed wiring card until said tabs hook over said back edges to secure said housing to said printed wiring cards; and

a stiffener bracket mounted on said printed wiring card adjacent said connectors, said latching device being mounted on said stiffener bracket.

3,867,001
SPARK PLUG ADAPTER AND METHOD OF MAKING

Robert W. Hedman, 11260 Overland Ave., No. 26C, Culver City, Calif. 90230

Filed Dec. 26, 1973, Ser. No. 427,933
Int. Cl. H01r *13/50*
U.S. Cl. 339—26 **2 Claims**

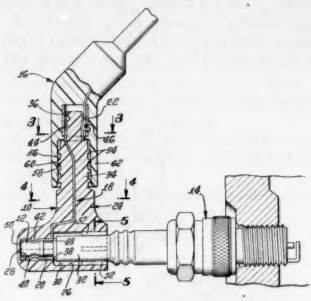
1. In a spark plug ignition-wire adapter, the combination of:

an integral body member formed of a non-conductive, elastomeric material, having a socket portion having an axis and having a socket adapted to fit over an exposed terminal of a spark plug, and having a connector portion having an axis and extending at an angle from said socket portion;

a conductor formed of electrically conductive material, embedded in said body member, and having a first end extending into said socket for electrical engagement with such a terminal, and having a second end extending out of said body member for electrical engagement with an ignition wire connector;

the axis of said connector portion being substantially perpendicular to the axis of said socket portion and said axes intersecting about midway between the ends of said socket portion; and

said first end of said conductor being generally tubular in form to receive in frictional engagement the exposed terminal of a spark plug, and said connector portion having an outer end provided with an integral concentric boss extending therefrom around which said second end of said conductor substantially extends for frictional

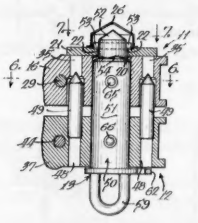


engagement with an ignition wire connector, said second end of said conductor also being generally tubular in form.

3,867,002
ELECTRICAL CONNECT-DISCONNECT DEVICE

Ronald P. Bridges, Bridges Electric, Inc., 2451 Wisconsin St., Downers Grove, Ill. 60515

Filed Feb. 19, 1974, Ser. No. 443,426
Int. Cl. H01r *13/32*
U.S. Cl. 339—88 R **10 Claims**



1. A connect-disconnect device for use with high voltage electric lines comprising, in combination:

a female terminal member adapted to be electrically connected to a main conductor line, said female terminal member having an annular wall defining a socket which is open at one end and has longitudinal slots;

resilient electrical contact means in said socket,

shoulder means on said wall adjacent said slots,

and first key means on the female terminal member;

a carrier member adapted to be electrically connected to a branch conductor line, said carrier member having an annular wall defining a sleeve which is open at both ends, resilient electrical contact means in said sleeve,

and second key means on said carrier member engageable with said first key means to prevent relative rotation between the female terminal member and the carrier member;

a cylindrical male terminal member rotatably mounted in said sleeve, said male terminal member having a plug portion adapted for insertion into the socket of the female terminal member,

external shoulders on said plug portion which move through the longitudinal slots of the female terminal member as the plug portion is inserted in the socket, said male terminal member being rotatable when the plug portion is fully inserted to engage said external shoulders with the shoul-

der means on the female terminal member and thereby releasably lock the male terminal member in the female terminal member,

and electrical contact means on the male terminal member which is in engagement with the electrical contact means in the socket and in the sleeve in the locked position of the male terminal member.

3,867,003

SEMI-CONDUCTOR CLAMPING MEANS

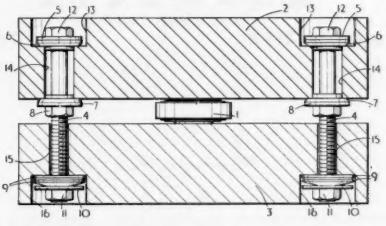
John Morton, Hazel Grove; Keith Drummond Stevens, Marple, and Graham Spencer Thexton, Marple Bridge, all of England, assignors to Cableform Limited, Cheshire, England

Filed May 30, 1973, Ser. No. 365,150

Claims priority, application Great Britain, June 8, 1972, 26670/72

Int. Cl. H01r *13/54*

U.S. Cl. 339—92 R **6 Claims**



1. An insulated heat sink clamp assembly for use with a semi-conductor, comprising: a pair of opposed clamping pieces of an electrical and heat conducting material for engagement at opposite sides of the semi-conductor to be clamped therebetween; and force transmitting means positioned within the outer periphery of the clamping pieces for drawing the clamping pieces into intimate contact at opposite faces of the semi-conductor, said force transmitting means comprising a pair of bolt assemblies disposed in spaced relation within and extending transversely through the clamping pieces for flanking relation at opposite side edges of the semi-conductor, means on the bolt assemblies for exerting a predetermined pressure on the semi-conductor, said bolt assemblies including electrical-insulating means thereon for insulating said assemblies from at least one of said clamping pieces, said clamping pieces forming electrical terminals for the semi-conductor to be clamped, said means for exerting a predetermined pressure including disc-spring washer means through which force is transmitted to the clamping pieces and the semi-conductor said spring-disc washer means having deflection saturation characteristics such that a predetermined force is imposed on said semiconductors by said clamping pieces when saturation deflection is reached.

3,867,004

ELECTRICAL CONNECTION DEVICE

Roman J. Komorowski; Jean-C. Verneray, and Gilles F. A. Tournier, all of Colomiers, France, assignors to ITT Industries, Inc., New York, N.Y.

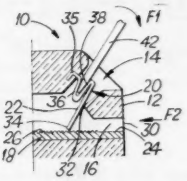
Filed Dec. 7, 1973, Ser. No. 422,969

Claims priority, application France, Dec. 21, 1972, 72.45701

Int. Cl. H01r *9/08, 9/12*

U.S. Cl. 339—95 D **7 Claims**

1. In an electrical connection device comprising an insulator casing, at least one contact piece and a corresponding contact blade in said casing disposed at an acute angle with respect to said contact piece, said blade being resiliently urged toward said contact piece whereby an electrical wire slipped into the acute angle between said blade and said contact piece will be pressed against said contact piece and held in position by said blade, the improvement which comprises articulation means for said blade allowing pivotal movement of said blade toward and away from said contact piece, said articulation means including a resilient conductive strip having a generally Z-shaped configuration and a pivot point formed on said casing within the plane of said strip, the lower arm of said



Z-shaped strip terminating in said contact blade and being pivotal about said pivot point, the free end of the upper arm of said Z-shaped strip being fixed to said casing, said upper arm and the slanting portion of said Z-shaped strip forming an indentation adapted to receive a tool which, when pivoted, pivots said blade about said pivot point so as to have its free end moved away from said contact piece.

3,867,005

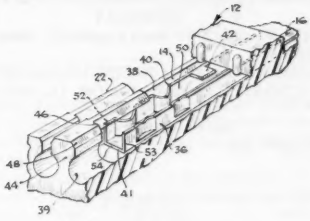
INSULATION-PIERCING CONTACT MEMBER AND ELECTRICAL CONNECTOR

Paul Peter Hoppe, Jr., Arlington Heights, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 288,998, Sept. 8, 1972,. This application Sept. 10, 1973, Ser. No. 395,746

Int. Cl. H01r *9/06*

U.S. Cl. 339—98 **9 Claims**



1. In an electrical contact member for electrical connection to circuit element including an insulation-covered electrical conductor, a terminal element of thin sheet metal construction including at least one notch for cutting the insulation of said conductor and electrically engaging the underlying conductor, said terminal element comprising

an elongated channel of U-shaped, cross-sectional configuration with opposite sidewalls having opposite facing portions dimpled inwardly to provide at least one pair of inner detents, the space between said detents constituting said notch, said space between said detents being less than the distance between said sidewalls, each of said detents comprising

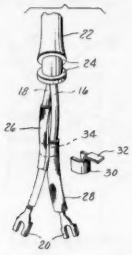
a pair of wall sections, each of said wall sections having one end integrally joined to the adjoining sidewall, the other ends of said sections joined together by a curved portion at said notch to provide an enlarged wiping surface for said conductor, said curved portion having a free edge and a slit along said free edge, said slit including at least one tapered cutting edge to form an insulation-cutting surface.

3,867,006

APPLIANCE CORD-CONNECTING STRUCTURE

Ronald E. Jeffress, Alta Loma, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed Aug. 3, 1973, Ser. No. 385,480
Int. Cl. H01r *13/58*
U.S. Cl. 339—103 M **8 Claims**



1. For use in an electric appliance having an electric cord secured to terminals therein by a cord portion having separated conductors extending outside said appliance and a strain relief means clamping said conductors and adapted to mount in said appliance to reduce stress on the terminals, the improvement in the insulating structure of said cord comprising, at least a single insulator on one conductor extending primarily only from said relief clamping means away from said terminals, and

a second insulator on the other conductor extending primarily only from said relief clamping means toward said terminals,

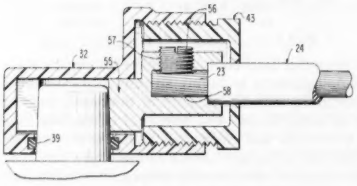
said relief clamping means securing each insulator at opposite ends thereof to the conductors.

3,867,007

BATTERY TERMINAL CONNECTOR AND HOUSING ASSEMBLY

Richard R. Wening, 2113 North Eastside St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 293,334, Sept. 29, 1972, Pat. No. 3,790,920. This application Oct. 11, 1973, Ser. No. 405,587
Int. Cl. H01r *13/52, 13/54*
U.S. Cl. 339—236 **1 Claim**



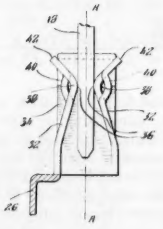
1. A battery terminal connector and housing assembly comprising a split connector cap having a bore to receive a battery terminal post, said connector cap having a rear shank and said shank having an axial opening in its rear end adapted to receive a battery cable end, said shank having a radial threaded opening intersecting said axial opening, a clamping set screw engaged in said threaded opening and adapted to clampingly engage said battery cable end, said connector cap having a rear serrated end face at the forward end of said shank and extending around the lower end of said shank substantially in a semi-circular arc, a housing member for said connector cap and battery terminal post and shaped with relation to said cap to cause the cap to grip the post in response to forward pressure on said serrated end face, said housing member having a rear enlarged internally threaded sleeve portion surrounding said shank, and a pressure sleeve having external screw-threads engaged within the screw-threads of said sleeve portion and forming therewith an enclosure for said shank, battery cable end and set screw, said pressure sleeve having a rear end opening adapted to receive and snugly engage the insulated portion of a battery cable, said pressure sleeve having an annular forward serrated end face adapted to engage the semi-circular serrated end face of the cap when the pressure sleeve is tightened, the serrations of said faces resisting loosening of the pressure sleeve.

3,867,008

CONTACT SPRING

Albert J. Gartland, Jr., Trumbull, Conn., assignor to Harvey Hubbell Incorporated, Bridgeport, Conn.

Filed Aug. 25, 1972, Ser. No. 283,790
Int. Cl. H01r *13/12*
U.S. Cl. 339—258 R **7 Claims**

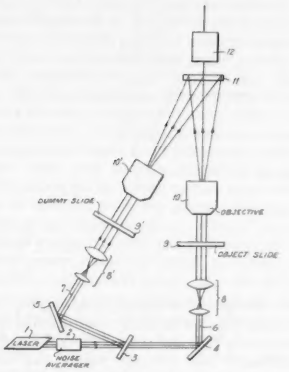


1. An electrical female contact comprising; spring members disposed to deflect in opposite directions away from a central plane as straight male contacts are slideably engaged therebetween, each said spring member having a contact surface and presenting an inclined tip across the full width of engagement, said inclined tips being complementarily oriented to create a guided entrance for the male contacts along said central plane, said contact surfaces being separated across the thickness of the male contacts upon engagement thereby and bearing against the male contacts under a contact pressure of proportional magnitude to the deflection incurred by said spring members, each said spring member including at least one advanced section and at least one retracted section, said advanced and retracted sections being juxtaposed on each said spring member in a direction substantially perpendicular to the direction of male contact engagement along said central plane, said advanced section of each spring member meshing across said central plane into said retracted section of said other spring member, said contact surfaces being disposed on said advanced sections at an offset distance from said central plane and deflecting thereacross through said offset distance during engagement by male contacts, whereby the total deflection at said contact surfaces of said spring members away from each other during engagement is the sum of said offset distances plus the thickness of the male contact and thereby said contact pressure is magnified proportionally to the sum of said offset distances.

3,867,009
HOLOGRAPHIC MICROSCOPE WITH SUPPRESSION OF COHERENT NOISE

Romuald Pawluczyk, Czeeniakowska Str. 18/55, Warszawa, Poland

Filed May 11, 1973, Ser. No. 360,376
Claims priority, application Poland, May 20, 1972, 155495
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **4 Claims**



1. A holographic microscope for recording and reconstructing of holograms and for interferometric investigation comprising laser illumination means for producing a coherent laser beam, a device for suppression of coherent noise by unidirectional averaging, a member splitting the laser beam into a reference beam and an object beam, a first optical system for directing said object beam to a holographic recording material along a first path and for forming an image of an object on said recording material, and a second optical system similar to said first optical system for directing said reference beam to said recording material along a second path angularly displaced from said first path and having a length substantially equal to the length of said first path, the axes of said first and second paths lying in a plane, said device for unidirectional averaging of the coherent noise being positioned between said illuminating means and said beam splitting member and comprising a confocal pair of focusing lenses together defining an optical axis and focusing said laser beam to a spot intermediate said lenses, a mask having a slit aperture situated at said focused spot, and averaging means disposed in front of said mask for continuously deflecting said spot in one direction only along the lengthwise direction of said slit, said mask and averaging means being coupled for rotation about said optical axis so as to orient said one direction optically perpendicular to said plane containing said axes of said first and second paths.

3,867,010
VERTICAL INTERVAL REFERENCE SIGNAL EXTRACTION CIRCUIT ARRANGEMENT

Theodore S. Rzeszewski, Lombard, Ill., assignor to Motorola, Inc., Chicago, Ill.

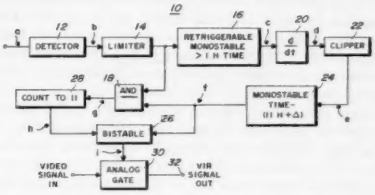
Filed July 2, 1973, Ser. No. 375,981
Int. Cl. H04n *9/62*
U.S. Cl. 358—10 **8 Claims**

1. A signal extraction circuit arrangement suitable for extracting signal information included at a selectable interval in a base signal having, inter alia, recurrent reference pulse information, which signal extraction arrangement includes in combination:

counter means for counting a selected number of said reference pulses and producing a control signal in response thereto;

means for responding to said reference pulse information and conditioning said counter means to initiate counting action at a prescribed time;

gating means responsive to said control signal of said counter means to permit the extraction of the desired signal information coincident therewith; and

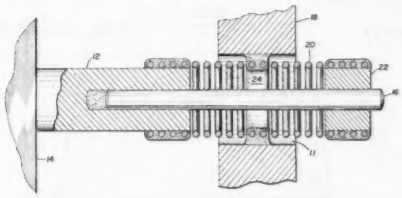


timing means coupled with said gating means and responsive to said reference pulse information for selectively adjusting the response of said gating means over a predetermined time interval and thereby varying the amount of signal information being extracted.

3,867,011
CENTER ATTACHED OPTICAL MOUNT

Richard H. Burns, Webster, N.Y., assignor to Bausch & Lamb Incorporated, Rochester, N.J.

Filed Feb. 5, 1973, Ser. No. 329,778
Int. Cl. G02b *23/16*
U.S. Cl. 350—16 **2 Claims**



1. A device for mounting an optical member within a chamber having at least one wall, the optical member having an aperture and being immersed in a transparent fluid contained within the chamber, comprising:

a bushing means disposed within the chamber;

shaft means being affixed to and extending from the wall of the chamber; and

resilient coil means extending through the aperture of the optical member and having a first end and an opposite end, the first end being attached to a first location on said shaft means and the opposite end being affixed to a second location on said bushing means, and the optical member being connected within the aperture to said resilient coil means centrally of the first and second locations.

3,867,012
NOVEL LITHIUM NIOBATE SINGLE CRYSTAL FILM STRUCTURE

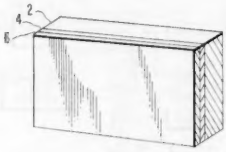
William Phillips, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,763
Int. Cl. B44d *1/16;* **G02b** *5/14*
U.S. Cl. 350—96 WG **9 Claims**

1. An article consisting essentially of an oriented lithium tantalate crystal, a layer of platinum from about 150 to 2,500 angstroms thick thereon and an epitaxial single crystal lithium niobate film on the platinum layer.

3. A method of forming an epitaxial single crystal layer of lithium niobate on a conducting surface which comprises:

a. depositing a coating of platinum from 150 to 2,500 angstroms thick on a polished surface of a single crystal lithium tantalate substrate,



b. depositing a layer of finely divided lithium niobate onto the coated substrate, and

c. fusing the lithium niobate to form said epitaxial single crystal layer.

3,867,013

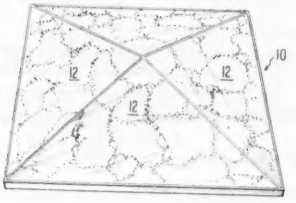
THREE DIMENSIONAL MIRROR TILE

Sidney Ashenfarb, Roslyn, N.Y., assignor to New Age Mirror and Tile Industries, Inc., Newark, N.J.

Filed Sept. 10, 1973, Ser. No. 396,022

Int. Cl. G02b *5/08*

U.S. Cl. 350—299 **4 Claims**



1. A decorative three-dimensional mirror tile apparatus comprising:

four side mirror segments, each side segment including a base edge and a pair of convergingly directed side edges; a molded plastic, pyramid-shaped base including four substantially flat side surfaces and a base periphery in the form of a square;

ridge means located at the intersection of said side surfaces and also located at the periphery of said base, said ridge means completely circumscribing said side surfaces and thereby forming pockets into which said side mirror segments may be directly placed;

an adhesive means for securing said mirror segments to the side surface of each pocket, said adhesive means forming the sole attachment between said mirror and said base;

at least two L-shaped recesses located in at least two of said side surfaces, said L-shaped recesses being located adjacent to said peripheral base ridge means and intermediate the ridge means located at the intersection of said side surfaces, the location of said recess being such that said recess is completely covered by said side mirror segments when said segments are in place in said side pockets, said L-shaped recesses further including a flat pad portion lying substantially in the plane defined by the periphery of said base; and

fastening means for attaching the flat pad portion of said L-shaped recesses to a substantially flat surface.

3,867,014

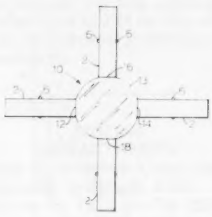
SYMMETRIC BIREFRINGENCE MODULATOR

James C. Kemp, 2642 Lowrey Ave., Honolulu, Hawaii 96822

Filed Feb. 7, 1973, Ser. No. 330,216

Int. Cl. G02f *1/24*

U.S. Cl. 350—149 **11 Claims**



1. Optical resonant photoelastic birefringence modulator apparatus comprising a stress-plate constructed of an isotropic material and having first and second faces through which an optical-transmission axis centrally passes and having edge means surrounding the stress-plate and peripherally interconnecting the faces, the edge means being substantially uniformly spaced from the optical-transmission axis passing through the center of the faces, and oscillation producing transducer means connected to at least one portion of the edge means for stressing the stress-plate.

3,867,015

LIQUID CRYSTAL CELL AND METHOD OF FABRICATION

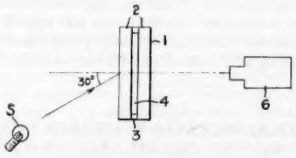
Shuichi Iida; Takao Hayashi; Satoshi Noguchi, and Shigemasa Furuuchi, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed May 23, 1973, Ser. No. 363,190

Claims priority, application Japan, May 25, 1972, 47-51221

Int. Cl. G02f *1/16*

U.S. Cl. 350—160 LC **8 Claims**



1. In a liquid crystal cell comprising a pair of substrates each covered with an electro-conductive film wherein at least one of the substrates is transparent and wherein a liquid crystal material fills the space between the substrates, the periphery of the substrates being sealed, the improvement which comprises applying to the inner surface of the cell a functional fluoroalkyl compound containing a fluoroalkyl component and a functional component which has an affinity and reactivity to the inner surface of the cell.

3,867,016
LIQUID CRYSTAL COMPOSITION FOR ELECTRIC FIELD INDICATION

Masahiko Sagane, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Hyogo-ken, Japan

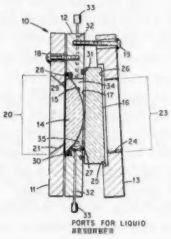
Filed Feb. 12, 1973, Ser. No. 331,692
Claims priority, application Japan, Feb. 17, 1972, 47-16037
Int. Cl. C09k *1/00*; **G01n** *31/22*
U.S. Cl. 350—160 LC **9 Claims**

1. A liquid crystal composition for indicating the occurrence of electric field which consists essentially of from about 10 to about 60 percent by weight of cholesteryl carbamate having, as the substituent group at nitrogen atom of the carbamate an open chain hydrocarbon group, and from about 40 to about 90 percent by weight of cholesteric liquid crystal taken from the group consisting of cholesteryl halides, cholesteryl ethers, cholesteryl esters, cholesteryl carbonates, cholesteryl thiocarbonates, 24-methylcycloaltanol esters, 24,28-dihydrocycloeucanol esters and cycloaltenor esters and mixtures thereof, said open chain hydrocarbon group is an aliphatic hydrocarbon group having carbon atom number of not more than 24 selected from the group consisting of methyl group, ethyl group, n-propyl group, n-butyl group, n-pentyl group, n-hexyl group, n-heptyl group, n-octyl group, n-nonyl group, capryl group, n-undecyl group, lauryl group, myristyl group, palmityl group, stearyl group, arachidyl group, lignoceryl group, myristoleyl group, oleyl group, elaidyl group, erucyl group, linolyl group, tiglyl group and aliphatic groups having a chemical formula such that one methylene group in the alpha position is diminished from myristyl group, palmityl group, stearyl group, arachidyl group, lignoceryl group, myristoleyl group, oleyl group, elaidyl group, erucyl group, linolyl group or tiglyl group.

3,867,017
APODISED APERTURE ASSEMBLY FOR HIGH POWER LASERS

Erlan S. Bliss, Dublin, and David Ralph Speck, Alamo, both of Calif., assignors to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

Filed Nov. 27, 1973, Ser. No. 419,315
Int. Cl. G02b *9/00*, *9/08*
U.S. Cl. 350—205 **5 Claims**

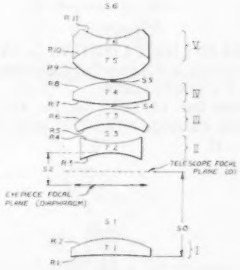


1. An apodised aperture assembly for minimizing deleterious diffraction effects in a laser beam comprising: a support assembly having an aperture extending therethrough, a pair of window means positioned in said support assembly and in alignment with said aperture, said support assembly comprising a central section and two outer sections secured to said central section on opposite sides thereof, each of said support assembly sections being provided with a centrally located aperture having portions thereof of a cross section less than the periphery of said pair of window means, said pair of window means being substantially optically neutral and configured to define within said aperture a chamber having a thickness near zero at the center thereof and increasing thickness with increasing radius from the center thereof, one of said pair of window means comprising a lens having a convex surface, the other of said pair of window means comprising an optical element having a flat surface in abutment with said central section of said support assembly, said flat surface of said optical element being positioned closely adjacent said convex surface of said lens so as to define in cooperation with said aperture of said central section of said support assembly said radially increasing thickness chamber containing an absorbing liquid, said lens being substantially positioned in said aperture of said central section of said support assembly and retained therein by one of said two outer sections of said support assembly, said optical element being retained in abutment with said central section by the other of said outer sections, said chamber being substantially defined within said aperture of said central section of said support assembly, sealing means positioned about said chamber intermediate said window means and said support assembly comprising a first seal located intermediate said lens and said central section of said support assembly and a second seal located intermediate said optical element and said central section of said support assembly, and absorber material positioned in said chamber, said absorber material having a thickness near zero in the center and increasing in thickness with increasing radius, whereby a smoothly varying transmission profile is provided as a laser light beam passes through said aperture assembly minimizing diffraction effects.

3,867,018
FIVE COMPONENT MICROSCOPE EYEPIECE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 288,207, Sept. 11, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 438,974
Int. Cl. G02b *25/00*
U.S. Cl. 350—216 **3 Claims**



1. A five component microscope eyepiece having a magnification of substantially 10X consisting of the following components in optical alignment: A plano concave positive lens I; a double concave singlet II; a meniscus shaped negative singlet III; a double convex singlet IV; and a convex concavo positive doublet V.

3,867,019
PHOTOGRAPHIC REFLECTOR

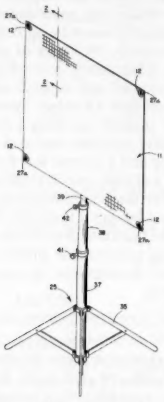
J. R. Eyerman, 475 Seventeenth St., Santa Monica, Calif. 90402

Filed June 22, 1973, Ser. No. 372,527
Int. Cl. G02b *5/10*
U.S. Cl. 350—295 **4 Claims**

1. A photographic reflector comprising:
a flexible reflector screen, the surface of said screen being embossed to form a plurality of separate dish shaped

reflector elements, said screen having aperture means at each of the corners thereof;

a collapsible support frame for supporting said screen, said support frame comprising a central mount in the form of a block shaped member having a plurality of apertures spaced thereabout and a plurality of rod members which are removably fitted in said apertures and extend radially outwardly from said central mount, each of said rod



members having an end hook portion for engaging a separate one of the aperture means of said screen and including means for resiliently urging said hook portions outwardly whereby said screen is tautly supported on said frame to form an overall flat screen with said embossed reflection surface; and

stand means for supporting said frame for adjustment in azimuth and elevation.

3,867,020

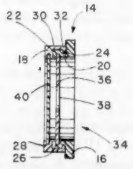
CONTROLLED LIGHT LIMITING LENS ASSEMBLY

Harold N. Braunhut, c/o Honey Toy Industries, Inc., 200 Fifth Ave., New York, N.Y. 10010

Filed Dec. 17, 1973, Ser. No. 425,313

Int. Cl. G02c *7/16, 7/12*; **A61f** *9/04*

U.S. Cl. 351—45 **16 Claims**



1. A light-limiting lens assembly comprising a first lens member in the form of a sheet of louvered material provided with a central aperture which defines a limited angle of light acceptance disposed along a line of sight, said louvered material preventing the passage of light having an angle of incidence greater than said angle of light acceptance relative to said first lens member; and a second lens member made of a polarized material and disposed juxtaposed in a plane substantially parallel to that defined by said first lens member along the line of sight, said central aperture and said second lens member being aligned along the line of sight, and said second lens member being rotatable relative to said first lens member, whereby the light transmitted through the lens assembly is further limited by selection of a single angle of polarization of light incident within said angle of light acceptance.

9. A pair of eyeglasses comprising a lens frame having two spaced frame member portions adapted to be placed in front of a wearer's eyes, each frame member portion including a fixed portion and a movable portion concentrically mounted on said fixed portion, said movable portion being rotatable in a plane generally normal to the direction of sight; a first lens member of polarized material mounted on said movable portion for common rotary movement with the latter for controlling the angle of polarization of light which passes therethrough; and a second lens member of louvered material mounted on said fixed portion, said louvered second lens member being provided with a central aperture and defining a limited angle of light acceptance, whereby only appropriately polarized light within said angle of light acceptance is permitted to be transmitted to the observer, the eyeglasses preventing the passage of polarized light or extraneous light the angle of incidence of which is greater than said angle of light acceptance.

3,867,021

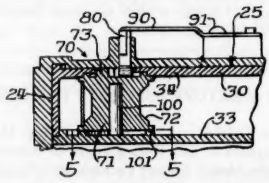
MOTION PICTURE CAMERA SYSTEM

Arthur C. Mueller, Niles, and Kenyon A. Hapke, Libertyville, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Aug. 24, 1972, Ser. No. 283,631

Int. Cl. G03b *23/02*

U.S. Cl. 352—72 **11 Claims**



1. A film-handling system comprising:

a film cassette having spaced walls for housing a supply of film including a film gate portion and film take-up means; a film-handling apparatus having a film chamber for receiving said cassette and including a light aperture;

positioning means within said film chamber engageable with said cassette to maintain said film gate aligned with said aperture during the operation of said apparatus;

film shuttle means for incrementally positioning segments of film in said gate to align the film with said aperture;

drive means for rotating said take-up means to accumulate said film onto said take-up means;

rotatable film snubbing means mounted for rotation about a selected axis within said cassette between said film gate and take-up means and being engageable with said film segments advancing to said take-up means and further including a locking portion on one end of said snubbing means accessible from the exterior of said cassette;

positive locking means provided on said apparatus and rigidly engageable with said locking portion of said snubbing means within said film chamber to firmly and positively lock said snubbing means from rotation within said cassette so that said locked snubbing means engages said advancing film segments and isolates the film segments at said gate from the film-moving force of said drive means during the operation of said apparatus;

means biasing said locking means inwardly into said film chamber; and

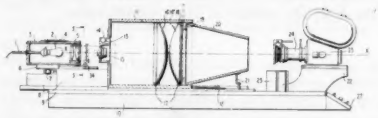
braking means axially aligned with said film snubbing means and arranged to frictionally retard the rotation of said snubbing means as said snubbing means is urged inwardly

by the force of said biasing means, said braking means comprising an arcuate friction surface spaced adjacent the periphery of said snubbing means and having a substantial surface area so that the frictional force of said braking means creates a substantial braking moment which resists the rotation of said snubbing means within said cassette during the operation of said apparatus.

3,867,022
CINECONVERSION MACHINE

Thomas Jefferson Whatley, Washington, D.C., and William Miller Drennen, Jr., Great Falls, Va., assignors to Communication Corps. Inc., Washington, D.C.

Continuation-in-part of Ser. No. 92,315, Nov. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 866,240, Oct. 14, 1969, abandoned. This application Oct. 13, 1972, Ser. No. 297,241
Int. Cl. G03b *21/32*
U.S. Cl. 352—87 **4 Claims**



1. An optical system for reproducing a picture with a variable rate of magnification, comprising:

support means for a picture to be reproduced on a distant receiving surface;

condensing lens means interposed between said support means and said receiving surface;

a first objective coaxial with said lens means movably disposed on the side of said lens means remote from said receiving surface for projecting an aerial image of said picture via said lens means in a transverse plane;

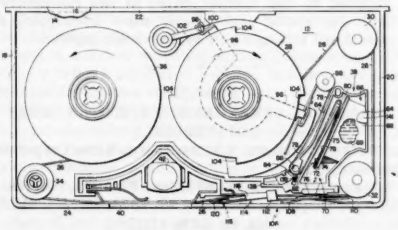
a second objective coaxial with said lens means focused upon said transverse plane and movably disposed on the side of said lens means opposite said first objective for projecting upon said receiving surface a replica of said aerial image; and

mechanism for jointly displacing said objectives with concurrent refocusing of said second objective to vary the relative proportions of said replica and said picture.

3,867,023
SEALING APPARATUS FOR A SELF-PROCESSING CASSETTE

Robert J. Ell, Malden, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 22, 1974, Ser. No. 444,970
Int. Cl. G03c *11/00*
U.S. Cl. 352—130 **27 Claims**



1. A film handling cassette comprising:

a cassette housing configured to retain a strip of photographic film; and

processing means for treating said film strip with processing fluid, said processing means including:

a processor housing, said housing including means defining an aperture in an outer wall thereof;

a reservoir located within said processor housing for retaining a quantity of processing fluid;

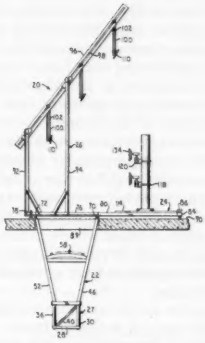
selectively operable means for releasing such processing fluid from said reservoir for deposit on said film strip, said selectively operable means including an elongated member extending through said aperture and exteriorly of said processor housing, said elongated member being configured for displacement relative to said aperture to release such processing fluid within said processing housing; and

sealing means mounted proximate said aperture, said sealing means including means movable into a fluid sealing position relative to said aperture responsive to displacement of said elongated member to release such fluid so as to prevent exiting of such fluid through said aperture following release of such fluid.

3,867,024
RACK ASSEMBLY

Tom F. Smith, Urbana, Mo., assignor to United States T.R.A.D. Corporation, Springfield, Mo.

Filed Mar. 5, 1973, Ser. No. 338,318
Int. Cl. G03b *21/14, 21/28, 3/00*
U.S. Cl. 353—82 **8 Claims**



1. An apparatus for use with a film projector wherein said apparatus operates to project a plurality of images from an image emanating from said projector to a corresponding plurality of viewing locations, said apparatus comprising:

a lens support adapted to support a plurality of lenses at respective positions wherein each lens receives said image from said projector and directs a discrete image therefrom, said lens support including means for independently adjusting the position of each lens with respect to said projector to permit individual focusing of each lens,

a plurality of spaced mirrors, each mirror operable to reflect a grouping of said discrete images to an intermediate location,

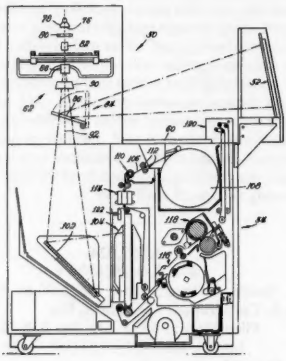
a frame supporting said mirrors in spaced relation from said lens support and from one another, said frame including means for positioning said mirrors to independently align each mirror for reflecting said grouping of said images to said intermediate location, and

means for directing said images from their respective intermediate locations to said viewing locations.

3,867,025
MICROFICHE VIEWER-PRINTER MACHINE

Donald E. Raterman, Hollywood, Fla., and Joseph Goebel, The Hague, Netherlands, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 16, 1973, Ser. No. 389,026
Int. Cl. G03g *15/00*
U.S. Cl. 355—5 **12 Claims**



1. A device for selectively displaying or reproducing images disposed on a microfiche comprising

an illumination path,

means for automatically transporting said microfiche through said device, said transporting means including first and second independently actuable motive means for automatically positioning one of said images in said illumination path for display or reproduction by said device, said first motive means comprising a first movable slide or carriage, a first pair of drive pins positioned on a first pin disc connected to a rotatable output shaft of a first motor and a first rack having a plurality of slots for releasably, engageably receiving said first pair of drive pins, wherein the relative movement between said first pair of drive pins and first rack causes the movement of said first slide along a first path of travel,

means disposed in said illumination path for illuminating said one of said images to form a projected image of said one of said images,

a viewing screen for receiving said projected image and for visually displaying said projected image,

an exposure station for receiving said projected image to form a latent image of said projected image and

means for alternately directing said projected image to said viewing screen or to said exposure station.

3,867,026
ELECTROPHOTOGRAPHIC COPIER OF TRANSFER TYPE

Masaya Ogawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 167,398, July 29, 1971, abandoned. This application Dec. 27, 1972, Ser. No. 319,096
Int. Cl. G03g *15/22*
U.S. Cl. 355—8 **6 Claims**

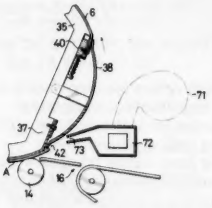
1. An electrophotographic copier of the transfer type comprising:

a document table fixed to the top of said copier and made of a transparent plate;

an exposure optical system of the slit scanning type including a projecting lens and having means for scanning the surface of an original document, said optical system being disposed below said document table;

an endless support disposed below said exposure optical system and movable at a constant peripheral speed, said support being detachably provided with a flexible photoreceptor having a size appproximately equal to the size of the image to be projected and said endless support having an entire peripheral length slightly greater than the length of said photoreceptor;

an image forming and copying assembly disposed around said endless support including means for charging said photoreceptor composed of a corona discharger, and followed by an exposure station at the terminal end of the light path of said exposure optical system where said charged photoreceptor is exposed to light projected through said optical system, developing means for visualizing with a toner an electrostatic latent image formed on said photoreceptor at the exposure station to produce a powder image, transfer means for applying a sheet of copy paper to said photoreceptor and transferring the powder image onto said sheet of paper, cleaner means for cleaning the surface of said photoreceptor after the paper has been peeled off said photoreceptor, and peeling means following said transfer means for peeling the paper sheet off the surface of said photoreceptor;



a paper supply station including paper supply roller means for dispensing sheets of said paper disposed adjacent to said developing means;

paper feed means for feeding said dispensed sheets of paper to said transfer means;

conveyor means disposed below said cleaner means for advancing said paper from said copier;

means disposed proximate the transport path of said conveyor means for heat-fixing the transferred image on said paper;

said photoreceptor support comprising a cylindrical drum having a depressed longitudinally extending portion and said peeling means comprising an arcuate cover member with a curvature of a smaller radius than said drum and an air duct for injecting a weak blast of air onto the outer periphery of said drum approximately in a tangential direction opposite to the direction of transport of the paper sheet, said cover defining a recess in the outer peripheral surface of said support and means for controlling said transfer means to apply a sheet of copy paper supplied by said transfer means to said photoreceptor with the leading edge of said paper overlapping said recess and leaving a part of said recess exposed.

3,867,027
TRANSPORT ARRANGEMENT FOR THIN SHEET MATERIAL

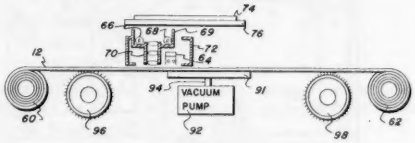
John W. Weigl, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 213,613, Dec. 29, 1971, Pat. No. 3,765,757. This application Apr. 19, 1973, Ser. No. 352,763
Int. Cl. G03g *15/22*
U.S. Cl. 355—8 **6 Claims**

1. An apparatus for image formation comprising:

a photoreceptor surface upon which a latent electrostatic image is to be formed;

means for transporting said photoreceptor surface, said transporting means comprising a transport body, means for imparting motion to said body, said body having secured thereon an electrically conductive mat and a plurality of electrically conductive contact members secured to and in electrical contact with the mat and extending from said mat for supporting and transporting said photoreceptor surface near distal segments of said contact



members at a spaced-apart location from said body for advancing said photoreceptor upon motion of said transport body;

means for transporting in sequence along a path spaced apart from and adjacent to said photoreceptor surface a corona source for establishing a uniform electrostatic charge upon said photoreceptor surface, and a projection means for projecting activating electromagnetic radiation at said photoreceptor surface in image configuration; and means for developing said image by contacting said image with a developer material.

3,867,028

DIAPOSITIVE COPYING APPARATUS FOR PHOTOGRAPHIC CAMERAS

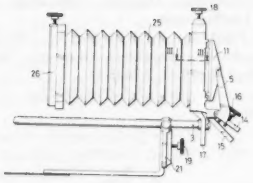
Ferdinand Kellner, 8941 Hart 14 near Memmingen, Germany

Filed June 5, 1973, Ser. No. 367,212

Claims priority, application Germany, June 28, 1972, 2231552

Int. Cl. G03b *27/32, 27/62*

U.S. Cl. 355—18 **7 Claims**



1. In a diapositive copying apparatus for photographic cameras comprising a first mounting connectible to an objective of a camera, a second mounting holding a diapositive and film carrier, a bellows connected between said first and second mountings for forming an adjustable light-tight housing and a rail guide on which said second mounting is mounted for movement therealong, the improvement wherein the said carrier and said second mounting are interengaged in the operative condition of the apparatus by one of the carrier and second mounting embracing the other, the said carrier having guide means embracing the second mounting from the exterior thereof, and these two parts are at least partially applied directly against one another and a spring disposed between the carrier and the diapositive for eliminating play therebetween.

3,867,029

PHOTOGRAPHIC COPYING ARRANGEMENT WITH IMPROVED COLOR COMPENSATION

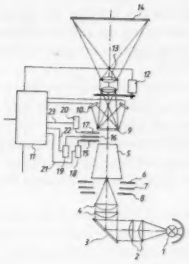
Volker Weinert, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,184

Claims priority, application Germany, Sept. 22, 1972, 2246466

Int. Cl. G03b *27/76*

U.S. Cl. 355—38 **14 Claims**



1. In photographic apparatus for making at least one color copy of a photo original on photosensitive material, in combination, light source means for illuminating said photosensitive material through said original in a first, second and third color; a first, second and third color channel including, respectively, first, second and third photoreceiver means for receiving light corresponding to light falling on said photosensitive material in said first, second and third color and furnishing, respectively, a first, second and third total color signal corresponding to the total quantity of light received respectively in said first, second and third color; first second and third comparing means comparing said first, second and third color signals, respectively, to a reference signal and furnishing, respectively, a first, second and third terminating signal when the so compared total color signal has a predetermined relationship to said reference signal; terminating means for terminating the exposure and the corresponding color in response to each of said terminating signals; means furnishing a density signal corresponding to the density of said original in a selected one of said colors; and means for connecting said means for furnishing a density signal to the corresponding one of said comparing means, whereby the furnishing of the corresponding one of said terminating signals depends at least in part upon said density signal.

3,867,030

FILM CONTROL SYSTEM BY PICTURE FRAME EDGE SIGNALS OF A FILM

Atsuyuki Tanaka, 2-1-Sonenishi-machi, Toyonaka-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 44,730, June 9, 1970, Pat. No. 3,721,495. This application Mar. 19, 1973, Ser. No. 342,493

Int. Cl. G03b *27/46*

U.S. Cl. 355—41 **4 Claims**

1. A system for controlling a mechanism for transporting a film along a first path, said film having a number of picture frames surrounded by black frames and successively disposed on said film in the direction of said first path, where each frame has a length of $a_o \pm a_x$, where a_o is the mean value and a_x is the tolerance and between neighboring picture frames there is an interval of $b_o \pm b_x$, where b_o is the mean value and b_x is the tolerance, said system including detecting means positioned along said first path for generating output signals in response to the density of said film, a first recording medium driven along a second path in synchronism with said transporting mechanism, first recording means for recording signals which include signals indicative of fore and aft edges of the

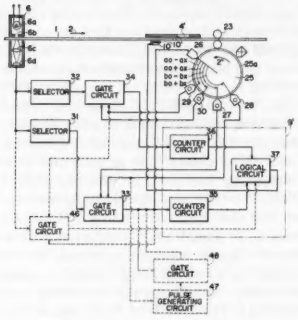
picture frames on said first recording medium in response to the output signals from said detecting means, first means for discriminating said recorded signals on said first recording medium to determine true fore and aft edge signals of one of said picture frames, an exposure station positioned along said first path, means for stopping actuated by an output from said first means for discriminating to stop the transportation of said film for positioning said picture frame having at least one of said detected fore and aft edge signals at said exposure station, said system comprising:

a second recording medium driven along a third path in synchronization with said transporting mechanism;

second recording means having its input coupled to the output of said detecting means and disposed on said third path for recording signals on said second recording medium;

second means for discriminating whether a respective signal of two kinds of output signals from said detecting means is a true fore or aft signal;

first means coupled between said detecting means and said second recording means for supplying first of said two kinds of output signals which change from a higher level



of an output signal of said detecting means to a lower level only when it is determined that the fore edge of one of the picture frames passes through said detecting means, to said second recording means and said second means for discriminating through the use of signals recorded on said second recording medium and on the basis of a mean value (b_a) of intervals between neighborning picture frames with each other disposed on the film and the tolerance (b_x) thereof;

second means supplying second of said two kinds of output signals which change from a lower level of an output signal of said detecting means to a higher level only when it is determined that the aft edge of one of the picture frames passes through said detecting means, to said second means for discriminating through the use of signals recorded on said recording medium and on the basis of a mean value (a_a) of length picture frames disposed on the film and the tolerance (a_x) thereof; and

said second means for discriminating generating an output for abruptly stopping said film transportation by rapidly actuating said means for stopping when neither of said two kinds of output signals is discriminated to be a true fore or aft signal.

3,867,031

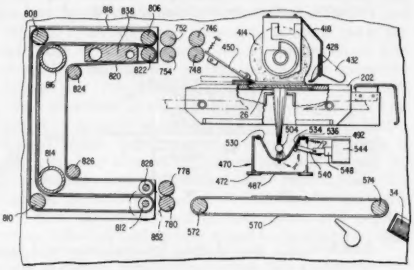
METHOD AND APPARATUS FOR ASSURING CONTACT BETWEEN THIN SHEETS OF MATERIAL

Nils L. Hakanson, West Springfield, Mass., assignor to Scott Paper Company, Delaware County, Pa.

Filed Feb. 7, 1974, Ser. No. 440,364

Int. Cl. G03b *27/02*

U.S. Cl. 355—78 **10 Claims**



1. Apparatus for establishing firm contact between superposed thin sheets of material, comprising:

a frame;

a support carriage mounted on said frame for carrying said superposed thin sheets of material; and

a freely rotatable, resilient roll disposed above said carriage at a spacing therefrom less than the roll radius, said roll being engaged by said carriage as the same transports said superposed sheets past said roll such that the roll is flattened and pressed against said superposed sheets on the carriage, said roll being journalled for free rotation on said frame whereby said roll is rotated by said carriage in synchronism therewith to preclude relative movement between said sheets.

3,867,032

ARRANGEMENT FOR OBJECTIVELY EVALUATING CHARACTERISTICS OF GEMS, PARTICULARLY DIAMONDS

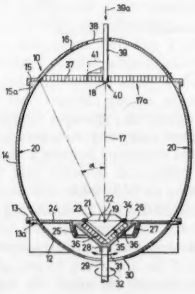
Gernot Klaus Bruck, Bornheim-Widdig, Germany, assignor to Diharo Diamanten Handels Compagnie Establishment, Mauren, Liechtenstein

Filed Mar. 8, 1974, Ser. No. 449,553

Claims priority, application Germany, Mar. 20, 1973, 2313783; Sept. 1, 1973, 2344144

Int. Cl. G01n *21/22*

U.S. Cl. 356—30 **20 Claims**



1. An arrangement for evaluating the optical characteristics of gems, especially diamonds, comprising, in combination, an

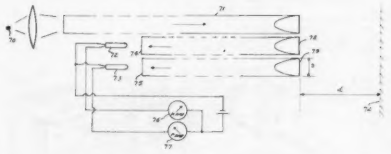
ellipsoidal mirror having a first focal point and a second focal point; light-emitting means for emitting light from said first focal point; gem support means for holding a gem at said second focal point with such an orientation that light emitted from said first focal point and reaching and entering the gem will be reflected by the gem towards a plane containing said first focal point and oriented normal to a line joining said focal points, said gem support means including means surrounding and engaging the gem and blocking off the passage of light past such gem around the outermost portions of the gem; and light-measuring means for measuring the light emitted from said first focal point and reflected by such gem towards said plane.

3,867,033

MULTI-COMPONENT FLOW PROBE

Siegfried H. Hasinger, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1973, Ser. No. 366,908
Int. Cl. G01n *21/00*
U.S. Cl. 356—103 **2 Claims**



1. A multi-component flow probe for examination of multi-component particle flows having a direction of flow through a confined space comprising:

a. a first fiber optic rod, a second fiber optic rod, and a third fiber optic rod having a first end of each of the said rods positioned in line parallel light insulating relationship and formed in a common wedge, the said wedge having an included angle within the range of 25° to 35°, the said point of the said common wedge having a radius from two to four times the average particle radius, and the second ends of the said first, second, and third fiber optic rods having flat polished surfaces substantially perpendicular respectively to their rod axes;

b. means for positioning the said common wedge of the said first ends of the said first, second, and third fiber optic rods in the said multi-component flow with the said wedge pointing substantially against the said direction of particle flow, and with the second ends of the said first, second, and third fiber rods exterior to the said confined space;

c. a light source communicating with the said second end of the said first fiber optic rod directing light into the said multi-component flow; and

d. means cooperating with the said second ends of the said second and third fiber optic rods for detecting the reflected light from the said multi-component flow.

3,867,034

LASER ANGULAR RATE SENSOR BIASING APPARATUS

Frederick Aronowitz, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

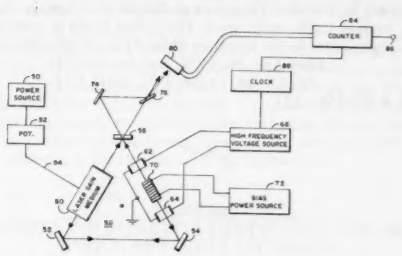
Filed Nov. 16, 1973, Ser. No. 416,518
Int. Cl. G01b *9/02*; **G02f** *1/26*
U.S. Cl. 356—106 LR **3 Claims**

1. Apparatus for use in the optical ring path of a ring laser to prevent mode locking, which comprises:

a. a Faraday material adapted to be placed in said optical ring path;

b. a first wave plate exhibiting electric field dependent birefringence and being characterized by a first index ellipse, said first wave plate in the optical ring path adjacent said Faraday material;

c. a second wave plate exhibiting electric field dependent birefringence, being constructed of the same material as said first wave plate and being characterized by a second index ellipse, said second wave plate placed in the optical ring path adjacent said Faraday material at the opposite



end from said first wave plate, with the second index ellipse oriented so that its principal axes are not parallel with the correspondent principal axes of the first index ellipse; and

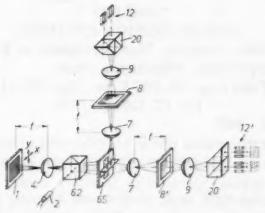
d. means for applying an electric field which varies cyclically in magnitude and polarity to said first and second wave plates, to achieve cyclic variations in the optical path length around the laser in each direction.

3,867,035

PHOTOELECTRIC STEP MARKER

Dietmar Kaul, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Dec. 17, 1973, Ser. No. 425,077
Claims priority, application Germany, Dec. 19, 1972, 2262065
Int. Cl. G01b *9/02*
U.S. Cl. 356—110 **4 Claims**



1. A photoelectric step marker for the measurement of the amplitude and sign of object displacements in two coordinates, comprising:

a. a measuring grating, which is divided in two mutually orthogonal directions and which is displaceable with the object;

b. two separate linear gratings each associated with a respective one of the two directions;

c. a spatial frequency filter, which for each of the two directions filters out the light resulting from diffraction at the measuring grating and which is arranged within an optical system disposed between the measuring grating and the linear gratings, the spatial frequency filter comprising light-deflecting optical components for the separation of the ray paths associated with each of the two directions;

d. optical means to produce an optical path difference of $\lambda/4$ between two mutually orthogonal directions of polarisation in the filtered-out light; and

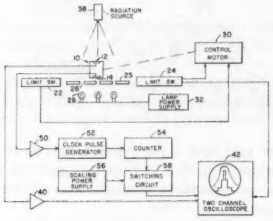
e. an individual polarising splitter with associated photoelectric receivers in the ray path associated with each of the two directions.

3,867,036

LIMIT DISPLAY CIRCUIT FOR RADIATION SOURCE ANALYSIS

Grant R. Detwiler, Orange, and Ronald E. Chastain, Tustin, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1974, Ser. No. 465,722
Int. Cl. G01j *1/00, 1/42;* **H01j** *3/14*
U.S. Cl. 356—121 **3 Claims**



1. A limit display circuit for comparing optical radiated energy with a precise limit function, comprising: a radiation source, an apertured plate having respective apertures selectively disposed along a straight line, detector means disposed for controlled movement adjacent said plate and between said source and said plate, said detector means having a first sensor responsive to radiant energy from said source and a second sensor responsive to radiant energy impinging on the opposite surface of said plate when precisely positioned adjacent respective apertures therein for providing first and second electrical output signals, and an oscilloscope coupled to said first and second sensors and responsive thereto for simultaneously indicating signals coupled therefrom.

3,867,037

LINEAR MOTION ENCODER

E. David Litke, Andover, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Aug. 29, 1973, Ser. No. 392,816
Int. Cl. G01b *11/04*
U.S. Cl. 356—169 **13 Claims**

1. An electro-optical linear encoder comprising:

an elongated housing having a defined linear travel path therealong;

an elongated rigid scale within said housing and having a plurality of alternately light responsive and non-responsive segments in parallel array along the longitudinal axis of one surface thereof, said scale being movable longitudinally within said housing;

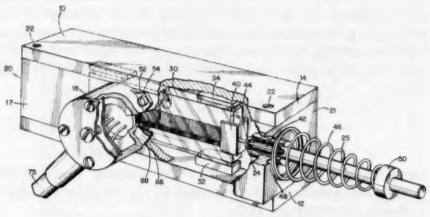
reticle means including a reticle fixed within said housing and having a plurality of alternately light responsive and non-responsive segments formed in a parallel array along a longitudinal axis of one surface thereof, the length of said reticle means along said longitudinal axis being less than the length of said elongated scale;

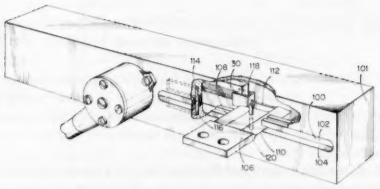
sealing means affixed to said housing for substantially isolating the interior of said housing from the external environment;

means for mounting said scale and reticle means for relative motion therebetween and along a longitudinal travel path within said housing and including:

a drive member extending through said sealing means into said housing and arranged for bidirectional movement therethrough and for longitudinal motion relative to said reticle means; and

means operative to couple said scale to said drive member in rigid relationship along the longitudinal axis of relative motion of said scale and in resilient relationship in at least one plane transverse to said longitudinal axis;





means in said housing for directing light onto said scale and said reticle to provide a sensible fringe pattern; and

sensor means within said housing for detecting said fringe pattern and for providing electrical signals in response thereto.

3,867,038

OPTICAL ALIGNMENT SYSTEM

William Westell, Weston, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 309,625, Nov. 27, 1972,. This application Aug. 29, 1973, Ser. No. 392,804
Int. Cl. G01b *11/26*
U.S. Cl. 356—172 **13 Claims**

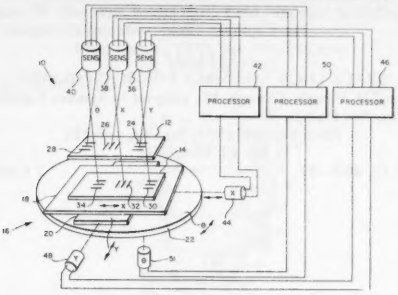
8. A system for aligning a pair of objects, each said object having reticle bars, said system comprising:

a. movable platform means on which at least one of the objects is mounted;

b. sensor means including rotating reticle means communicating with an optical path along which light flux of images of the reticle bars propogates, said rotating reticle means imaging fields of view of the reticle bars of the objects at a focal surface and for generating an optical image signal functionally related to the displacement of said fields of view in said focal surface, said optical image signal being a periodic electrical signal which is characterized by zero crossings; and

c. sensor electronic means operatively connected to said sensor means and said movable platform means, said sensor electronic means generating alignment signals related to said optical image signal, said sensor electronic means including threshold decision logic means having an established threshold level, said alignment signals gener-

ated by said sensor electronic means when said threshold level is exceeded before each zero crossing of said optical



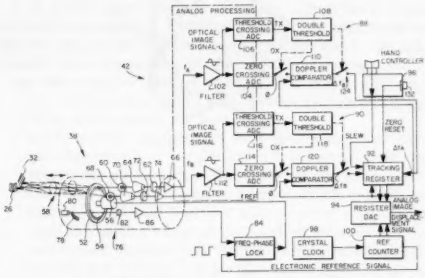
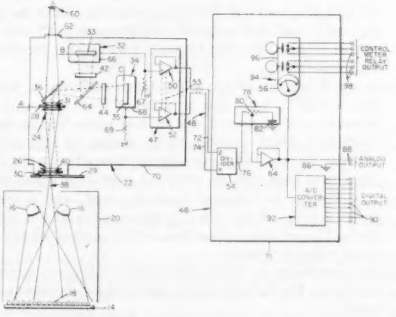


image signal, said alignment signals related to the relative displacement between the objects.

3,867,039
COLOR MONITOR FOR CONTINUOUS PROCESS CONTROL

John R. Nelson, Houston, Tex., assignor to Petty-Ray Geophysical, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 134,366, April 15, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,670
Int. Cl. G01j *3/50*
U.S. Cl. 356—178 **15 Claims**

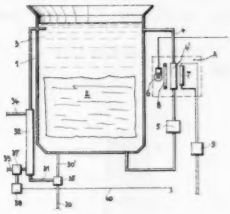


1. A system for continuously monitoring the color of a product, comprising means for viewing a selected illuminated area through which a stream of the product is passed, said means for viewing including first optical means for forming a diffuse image representative of the average color of the product passing through the selected area, transducer means including photosensitive elements, and second optical means for simultaneously imaging said diffuse image on said photosensitive elements via first and second light beam paths, said second optical means including means for filtering said first and second light beams at respective wavelengths selected from the optical frequency spectrum, the light energy level of each filtered beam being representative of the average color at the respective wavelength of the product passing through the selected area, said transducer means including means and for continuously generating a pair of electrical color signals representative of the light energy of the respective filtered light beams at said photosensitive elements, and electrical analog dividing means operatively coupled to the transducer means for dividing one of the electrical color signals by the other electrical color signal to provide a continuous color ratio signal functionally related to the instantaneous average color of the product passing through the selected area irrespective of variations in the brightness of the illumination.

3,867,040
METHOD AND APPARATUS FOR CONTROLLING THE DYEING OF TEXTILE MATERIALS

Oskar Loffler, Loimanns 7, 3874 Litschau; Rudolf Schlosser, Waidhofnerstrasse 88, and Gunther Dornheim, Otto-Frankegasse 110, both of Heidenreichstein, all of Austria

Continuation-in-part of Ser. No. 178,594, Sept. 8, 1971, abandoned. This application July 25, 1973, Ser. No. 382,497
Int. Cl. G01j *3/46, 3/48*
U.S. Cl. 356—181 **7 Claims**



1. A method of controlling the absorption of dye from a dye liquor by a textile material, comprising raising the temperature of the dye liquor while its light transparency remains substantially constant, and maintaining the temperature of the dye liquor substantially constant while its light transparency changes as dye is absorbed by the material, until the dye is at least substantially absorbed.

3,867,041
METHOD FOR DETECTING BRUISES IN FRUIT

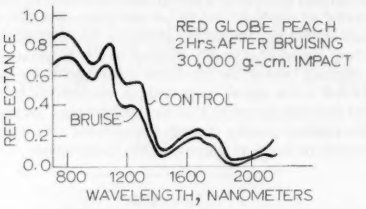
Galen K. Brown, Ashley, Ohio, and Larry J. Segerlind, East Lansing, Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 3, 1973, Ser. No. 421,379
Int. Cl. G01j *3/48*
U.S. Cl. 356—209 **6 Claims**

1. A method of detecting bruises in apples, peaches, pears, and the like comprising the steps of:

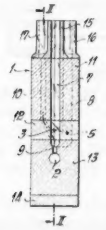
a. illuminating the outer surface of a fruit, said surface being unbroken, with diffuse light at wavelengths of from 700 to 2,200 nm.;

b. detecting the light reflected from the fruit surface with a photoemissive detector;
c. determining the amount of light reflected from the surface of an unbruised portion of said fruit;
d. determining the amount of light reflected from each portion of the entire fruit surface having an area equal to the area of the portion disclosed in (c);



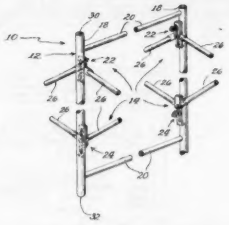
e. comparing the amount of light determined in (c) to the amount of light determined in (d); and
f. detecting a bruise in the fruit when the amount of light determined in (d) is significantly lower than the amount of light determined in (c).

3,867,042
CUVETTE CONSTRUCTION
Peter Mayer, Mullheim/Baden, and Anton Heinz Sutor, Freiburg, both of Germany, assignors to Hellma GmbH & Co., Mullheim/Baden, Germany
Filed June 7, 1973, Ser. No. 367,972
Claims priority, application Germany, June 19, 1972, 2229723
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **14 Claims**



1. A cuvette for measuring the properties of incremental qualities of liquids, comprising inlet means for receiving the incremental quantities of liquids to be measured, which are separated by gas bubbles; outlet means for withdrawing the liquids and the gas; and wall means defining a measuring channel having an input end and an output end communicating with said outlet means, and a separation chamber having an inlet end communicating with said inlet means, and an outlet end spaced from said inlet end, the latter wall means including a substantially horizontal bottom wall provided with an aperture communicating said outlet end of said chamber with said input end of said channel, and a top wall diverging from said bottom wall in direction from said inlet end to said outlet end, said top wall being provided in the region of said outlet end with an outlet communicating with said outlet means, whereby said bubbles upon entering said chamber through said inlet means follow a path along said top wall and through said outlet into said outlet means due to their buoyancy, while at least a substantial portion of any rspective incremental quantity of liquid follows a liquid path from said inlet end to said outlet end of said chamber and through said aperture into said measuring channel.

3,867,043
BRACE LOCK ASSEMBLY FOR SCAFFOLDING
Russell H. Plough, Chicago, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Filed Nov. 29, 1973, Ser. No. 419,921
Int. Cl. E04g *7/22*
U.S. Cl. 403—49 **7 Claims**



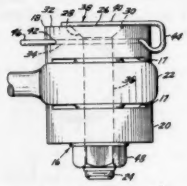
1. In a scaffolding system, in combination:
a post mounted in normal use with its longitudinal axis extending vertically; and
a brace lock assembly comprising:
a stud fixedly secured to said post and projecting radially outwardly therefrom, said stud being adapted to receive thereover the apertured end of an elongated cross-brace, a threaded bolt fixedly secured to said post in longitudinally spaced relation to said stud and projecting radially outwardly from said post in alignment with said stud,
a locking member mounted on said stud and said bolt for longitudinal reciprocal movement relative to said post,
said locking member having inner and outer legs each having means defining a slot therein and said slots being aligned for inserting said stud through both of them and for inserting said bolt through at least the slot in the inner leg, said stud and said bolt cooperating with said slot means in said inner leg to guide said locking member in said movement,
said legs being spaced apart a distance sufficient to receive the end of at least one cross-brace over said stud and between said legs, said slot in said outer leg having an open end which enables reciprocation of said locking member between an unlocking position wherein the outer leg clears said stud to enable a cross-brace end to be received on or removed from the stud, and a locking position wherein the outer leg receives the stud in the slot thereof to prevent a cross-brace end received on the stud from being removed,
seating means on said post adapted for sliding movement of said inner leg thereon during said locking member movement,
spring means mounted on said bolt and arranged for applying a radially inward force to one of said legs when constrained, and
nut means threadedly engaging said bolt for constraining said spring means to apply said force, whereby said locking member is secured to said post for longitudinal reciprocal sliding movement relative to the post while being constrained against free movement by frictional drag.

3,867,044

SECONDARY SAFETY DEVICE AND JOINT

James W. Downing, Buena Park, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Aug. 6, 1973, Ser. No. 386,090
Int. Cl. F16c 11/00
U.S. Cl. 403—155 2 Claims



1. A safetied joint, the joint including a flush head connector which is retained in a member defining a countersunk hole therein, said member having a surface from which said countersunk hole extends, the improvement comprising:

an inner surface of said member defining a safety hole therethrough parallel to said member surface and spaced from said countersunk hole; and

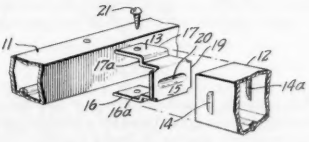
a safety member constructed from spring wire, said safety member having an end portion, a first portion at an angle to said end portion which is retained in said safety hole by said end portion, a second portion which engages said flush head of said bolt and said member adjacent said countersink and a central coil portion between said first and second portions, said first and second portions being parallel and defining a plane therebetween, and a portion of the flush head of said connector intersecting the plane defined between said first and second portions of said safety member.

3,867,045

TUBE CONNECTOR

Max D. Beals, Riverside, Calif., assignor to Amax Aluminum Company, Inc., San Mateo, Calif.

Filed Mar. 25, 1974, Ser. No. 454,288
Int. Cl. F16b 9/00
U.S. Cl. 403—190 7 Claims



1. A mechanical joint comprising one rectangular tube joined at an angle to another, said joint comprising,

a first hollow tube portion of rectangular configuration,

a U-shaped tube-connecting clip having a pair of legs which embraces transversely said first tube portion with the legs fastened thereto,

said U-shaped tube-connecting clip being of substantially rectangular configuration and having a substantially flat platform or web at its bight with said pair of legs depending from opposite edges of said bight, the free edges of said bight between the legs being in the form of extending ledges,

each of said legs having indexing shoulders laterally formed therein at a predetermined distance from said bight,

a second rectangular hollow tube portion having an open end into which the bight end of said clip is inserted in interference engagement therewith having inwardly projecting snap-retention means which provide spring-biased engagement with the free ledges of said clip following the insertion thereof, said snap-retention means being located a predetermined distance in from the open end of the tube corresponding substantially to the said predetermined distance between the indexing shoulders of the U-shaped clip and the bight thereof,

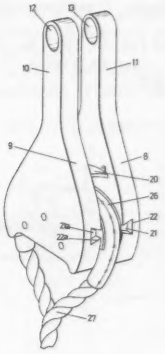
such that a substantially rigid mechanical joint is formed in which the indexing shoulders of the clip are held firmly against the end of said second tube with the ledges of the bight in engagement with the snap-retention means of the tube by virtue of the spring-biased action of said snap-retention means.

3,867,046

ROPE FITTING

Cyril Fox, Clayworth, near Doncaster, England, assignor to British Ropes Limited, Doncaster, Yorkshire, England

Filed Sept. 24, 1973, Ser. No. 400,031
Claims priority, application Great Britain, Oct. 20, 1972, 48483/72
Int. Cl. F16g 11/14
U.S. Cl. 403—210 6 Claims



1. A rope fitting comprising a pair of spaced walls facing one another, and a load bearing member mounted between and rigidly interconnecting the walls, at least one of the walls being releasable from the load bearing member, the load bearing member having an arcuate groove of rounded cross-section adapted to receive the crown of an eye formed at the end of a rope, the arcuate groove running generally parallel to the walls and being unobstructedly accessible to the crown of the eye when the said at least one wall is released from the load-bearing member.

3,867,047

JOINT CONSTRUCTION

Lawrance W. Wightman, St. Louis; Howard C. Gebhart, Chesterfield, and Nick Tichy, Affton, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

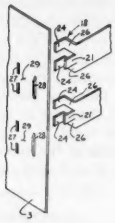
Filed Nov. 12, 1973, Ser. No. 415,008
Int. Cl. F16b 9/00
U.S. Cl. 403—242 10 Claims

1. A structure, comprising:

a first structural member having at least two spaced openings in it, the area between said openings defining a spring web; and

a second structural member having at least two tabs and a spring lever formed in it, said tabs being inserted through the openings in said first member and folded against said first member with a first applied force, said spring web and said spring lever having a second force applied to them in a direction opposite to said first applied force so

that said spring web is sprung in a direction opposite to the direction of said first applied force, said spring web



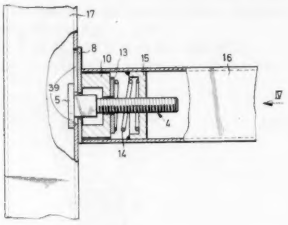
abutting said spring lever so that the elasticity of the web material causes said spring web to exert a residual force against said spring lever, establishing a tight joint.

3,867,048

PLUG CONNECTIONS FOR VERTICALLY ABUTTING FRAME SECTIONS

Abraham Endzweig, Brandlburgerstrasse 104, Regensburg, Germany

Filed Feb. 20, 1973, Ser. No. 333,466
Int. Cl. F16b *7/18, 7/20*
U.S. Cl. 403—252 **9 Claims**



1. A plug connection for frame sections comprising a bar having a recess at one end thereof; a cross wall member inside the recess and spaced from the end of the bar, an auxiliary pusher member located at the end of the bar, said cross wall member being provided with a threaded hole; a screw bolt having an enlarged head, a threaded end portion being threaded into said cross wall member, and a portion intermediate said head and threaded portion being square in cross section and the width thereof being at least equal to the diameter of the threaded portion; a biasing means about the screw bolt and positioned between the cross wall and the auxiliary pusher means; and a guide plate being non-rotatably mounted on the intermediate portion of the screw bolt, with the pusher means biasing the guide plate towards the head; the head of the screw bolt being beyond the end of the bar and adapted to fit into a hole and slot means in a member being connected.

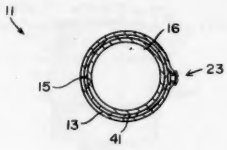
3,867,049

PRESTRESSED SHAFT GRIPPING ELEMENT

Delong Rice, Jr., 2140 Victoria Ave., Memphis, Tenn. 38116

Filed Apr. 16, 1973, Ser. No. 351,775
Int. Cl. B60b *27/06*
U.S. Cl. 403—344 **11 Claims**

1. A gripping element for gripping a shaft, said gripping element formed of resilient sheet metal and being formed into a circular configuration, said element being prestressed into a first position in which the inside diameter of said circle is normally slightly smaller than the diameter of the shaft over which it is intended to circumferentially extend and grip, and said gripping element being provided with a slit establishing confrontingly arranged end portions, camming means coacting with said end portions for yieldably expanding said element into a second position in which the diameter of said circle is expanded to selectively permit said gripping element to be freely passed circumjacent about the shaft whereby it may be moved to and fro along the length of the shaft while



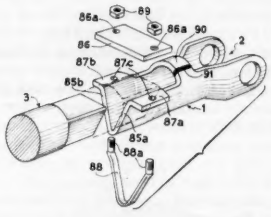
extending circumferentially thereabout and for permitting said gripping element a third more relaxed condition than when in said second position wherein said element grips the shaft firmly at the desired location thereon, said camming means being rotatable about an axis which extends radially outwardly from the shaft, and retaining means for holding said camming means against substantial radial outward movement.

3,867,050

ASSEMBLY OF A CONNECTING ELEMENT AND A TORQUE TRANSMITTING ELEMENT

Alfred Pitner, Paris, France, assignor to Nadella, Rueil-Malmaison, France, a part interest

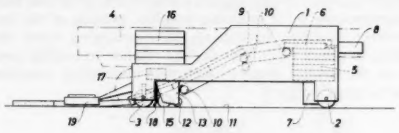
Continuation-in-part of Ser. No. 77,911, Oct. 5, 1970, Pat. No. 3,804,541. This application Apr. 21, 1972, Ser. No. 246,229
Claims priority, application France, Nov. 17, 1969, 69.39423
Int. Cl. F16b *2/02*
U.S. Cl. 403—373 **11 Claims**



1. An assembly of a shaft having an axis and a face with a connecting element constituted by a cold-formed sheet metal member having a portion defining a collar which is coaxial with and encompasses the shaft and comprises two longitudinally extending edge portions defining a throughway split in the collar and two ear portions which extend from said edge portions and have surfaces, said surfaces being spaced apart from each other such distance and said split having such width as to allow the collar to be mounted on the shaft by a relative radial displacement of the shaft and collar, tightening means extending through the ear portions and having a surface, an intermediate holding member located between the ear portions and having a face which engages said face of the shaft and having at least one other face which co-operates with at least one of said surfaces, whereby a relative displacement between the ear portions, the intermediate member and the tightening means causes the shaft to be gripped inside the collar, said shaft having a portion defining a non-circular keying face and one of two component parts of the assembly consisting of said intermediate member and said collar having a portion defining a non-circular keying face keyingly engaged with the keying face of said shaft, and means defining a bridge

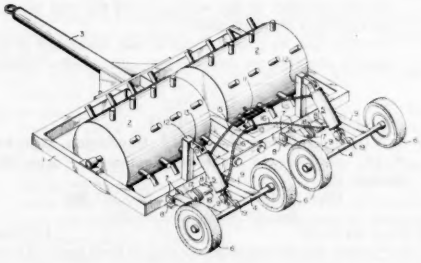
which is axially adjacent said ear portions and rigidly interconnects said edge portions and closes one end of said split.

3,867,051
STONE SETTING MACHINE
Georg Bjorhaag, Karlbergvagen 21, 66200 Amal, Sweden
Filed Aug. 1, 1972, Ser. No. 277,140
Claims priority, application Sweden, Aug. 2, 1971, 9860/71
Int. Cl. E01c *19/14*
U.S. Cl. 404—99 **3 Claims**



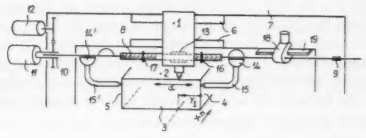
1. Machine for the setting of curbstones, sidewalk slabs and similar elements comprising a chassis of a vehicle capable of travelling on a bed on which elements are to be deposited, a magazine being supported by said chassis and capable of storing a plurality of said elements, an ejector mechanism connected to said magazine, an even and driven belt conveyor being arranged for receiving and transporting said elements from said ejector mechanism of said magazine to a delivery zone, in which said elements extend longitudinally of said chassis, when the setting operation is going on, or leaving said chassis, the direction of transportation of said conveyor belt at least in the setting zone being opposed to the intended direction of travel of said chassis and having a greater speed than the speed for which said chassis is arranged to be driven during the setting operation, whereby said elements in the setting zone with those of their edges which are perpendicular to the direction of travel of said belt conveyor, are pressed against each other at the same time as they are dragging against said belt conveyor, a feeler device arranged on said chassis which feeler device is positioned to follow said bed, a magazine equipped with a feeding out device for aggregate, said feeding device connected with said feeler device in such a manner that aggregate is automatically fed out at such spots, where said feeler device feels cavatives in said bed, a magazine and a feeding out device for a binding agent such as asphalt, being carried by said chassis and positioned for binding said bed material or pasting of said elements, said feeding out device for aggregate is located between two discharge openings of said feeding out device for the binding agent.

3,867,052
SHEEP'S FOOT ROLLER WITH LIFTING MECHANISM
Harvey Durham, P.O. Box 164, Manila, Ark. 72442
Filed Nov. 13, 1973, Ser. No. 415,420
Int. Cl. E01c *19/26*
U.S. Cl. 404—121 **8 Claims**



1. In combination with a roller adapted to be attached to a towing tractor having a fluid power circuit, said roller having an open rectangular frame in which a compaction roll is mounted, a lift mechanism mounted on the rear end of the frame behind said roll and comprising an axle of less length than said roll; ground wheel means journaled on said axle; arm means fixed at one end on said axle and pivotally connected at the other end to the rear end of the frame; a lug fixed on said axle; an hydraulic cylinder pivoted at its upper end on said frame above and to the rear of the pivoted connection of the arms means to the frame; a double-acting piston in said cylinder having a piston rod extending through the lower end of the cylinder and pivotally connected to the said lug at a point thereon which is always located to the rear of the pivotal connection of the arm means to the frame; ducts connecting the upper and lower ends of said cylinder through suitable valve arrangement with the fluid power circuit of the towing tractor; means on the frame limiting to vertical position the downward and forward swinging movement of the axle arm means; and means on the frame for locking the arm means at its lower limit of downward swing.

3,867,053
DEVICES FOR POSITIONING MOVABLE MEMBERS OF NUMERICALLY CONTROLLED MACHINES
Pierre Lecailtel, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France
Filed Jan. 12, 1973, Ser. No. 323,120
Claims priority, application France, Jan. 20, 1972, 72.01891
Int. Cl. B23b *39/04;* **B26d** *5/02*
U.S. Cl. 408—13 **7 Claims**



1. A device for controlling the position of movable elements of machines for machining elongated workpieces with the lateral side faces of the workpiece to be machined being reference sides, said device comprising:

a support disposed to surround a workpiece to be machined,

a vertical machining unit for machining a workpiece,

means for guiding said unit to cause said unit to be movable and positionable in a direction transverse to the longitudinal axis of the workpiece to be machined, and

means for changing the position of said unit from a position relative to one reference side to a position relative to the other reference side for performing a machining operation on a selected portion of the workpiece,

said means for changing comprising:

a centering device adjacent each lateral side of a workpiece to be machined for producing an accurate position of the unit relative to the respective side face and a feeler connected to each centering device adapted to abut a respective side face of the workpiece to be machined,

each centering device comprising two portions movable relative to each other, one portion of each centering device being connected to its respective feeler and the other portion of each centering device being connected to the machining unit so that when the machining unit is desired to be positioned relative to one of the reference sides the two movable portions of the centering device on that side are positioned in a specific orientation relative to each other.

3,867,054

UNIVERSAL DRILLING AND MILLING MACHINE WITH SEVERAL EXCHANGEABLE TOOLHEADS

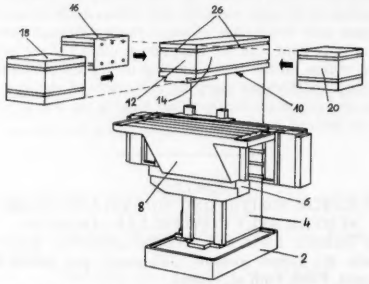
Johann Muller, deceased, late of Unterhaching, Germany (by Katharina Muller, legal representative), assignor to Friedrich Deckel Atiengesellschaft, Munich, Germany

Filed Mar. 26, 1973, Ser. No. 344,847

Claims priority, application Germany, Apr. 5, 1972, 2216401

Int. Cl. B23b *47/00*; B23c *1/12*

U.S. Cl. 408—234 R **4 Claims**



1. The combination of a universal drilling and milling machine having a base and a plurality of toolheads each being readily movable by a machine operator and equipped with self-contained drive means and first securement means adapted to secure said toolheads to means defining a rectangular-shaped horizontal cross slide having end faces and side faces, said horizontal cross slide means comprising means defining a plurality of first fastening means on at least one of said end faces and on at least one of said side faces, said first securement means being adapted to cooperate with said first fastening means to secure said toolheads thereto whereby said machine operator can select and interchange said toolheads to vary the location of said toolheads relative to said base.

3,867,055

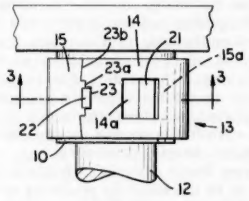
CIRCULAR CLAMP FOR TUBES

John A. Wooden, Indianapolis, Ind., assignor to Brookside Corporation, McCordsville, Ind.

Filed Nov. 12, 1973, Ser. No. 414,823

Int. Cl. F16b *2/08*

U.S. Cl. 403—373 **8 Claims**



1. A circular clamp adapted to join a tubular member and a concentric central member extending into the tubular member, said clamp comprising a one-piece, circularly formed resilient band having overlapping end portions, said band having a free inside diameter somewhat less than the outside diameter of the tubular member so that when in place on the tubular member the band exerts a compressive force thereon locking it to the central member, said overlapping band end portions each having apertures therethrough which are in register over a portion only of their area, and interfitting abutment surfaces on said overlapping band end portions, said interfitting abutments comprising a central notch cut in the tip of one of said overlapping band end portions and an upwardly directed tab fitting within the notch and struck from the surface of the other of said overlapping band portions, said registering portion of said apertures being adapted to accomodate a tool which when twisted in one direction enlarges said registering aperture portion to disengage said interfitting abutment surfaces and release a substantial portion of said compressive force on the tubular member, said overlapping band end portions being skewed in relation to each other by the twisting motion of the tool thereby removing said abutment surfaces from interfitting engagement and permitting said overlapping band end portions to bear against each other to prop said band in coompressive force releasing position, twisting of the tool in reverse direction permitting the overlapping band end portions to return from their skewed relation to locking position on the central member with said interfitting abutment surfaces again engaged.

3,867,056

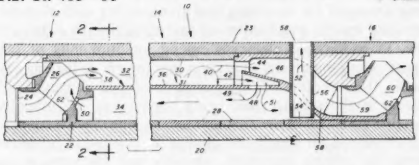
RECIRCULATING GAS SEPARATION MEANS FOR SUBMERSIBLE OIL WELL PUMPS

Joseph T. Carle, and Michael R. Brown, both of Tulsa, Okla., assignors to Oil Dynamics, Inc., Tulsa, Okla.

Filed Sept. 27, 1973, Ser. No. 401,398

Int. Cl. F04d *29/70*, *29/00*

U.S. Cl. 415—53 **4 Claims**



1. In an electric motor-driven rotary submersible well fluid pump, said pump having an impeller, said impeller having one or more shrouded fluid passageways, each passageway having an inlet and outlet, the improvement in means to separate gas from said fluid to be pumped, comprising:

a. essentially co-axial annular separation chamber and recycle chamber formed above and within the diametrical dimensions of said pump, said recycle chambers being inside said separation chamber;

b. said impeller having at least one opening in at least one wall thereof which opening provides communication between said passageway and the lower end of said annular recycle chamber;

c. means to direct fluid from the outlet of said impeller passageways into the lower end of said annular separation chamber;

d. means at the upper end of said separation chamber to by-pass a first part of said fluid from said annular separation chamber into the upper end of said recycle chamber, the remaining second part of said fluid being produced from said pump and said well;

e. gas relief means communicating the upper part of said recycle chamber to the well space of the well in which said pump is installed; and

f. whereby said by-passed fluids in said lower end of said recycle chamber are directed into said impeller opening.

3,867,057

SCREW PUMP

Peter Grujanac, Bartlett, and Clyde L. Huntington, Elgin, both of Ill., assignors to Lakeside Equipment Corporation, Bartlett, Ill.

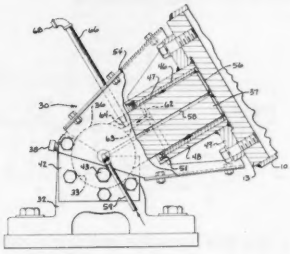
Filed Sept. 13, 1973, Ser. No. 397,065

Int. Cl. F03b *3/12*, *11/06*

U.S. Cl. 415—72 **11 Claims**

1. A screw pump including an elongate shaft inclined to the horizontal and having upper and lower ends, an upper bearing and a lower bearing supporting the shaft for rotation, and a spiral flight extending along the elongate shaft for raising a

liquid as the elongate shaft is rotated; characterized in that the lower bearing comprises a stub shaft coaxial with the elongate shaft; a bush circumjacent the stub shaft and connected to the elongate shaft for rotation therewith; means providing a lubrication channel between the bush and stub shaft; means including an inlet passageway through the stub shaft for providing an inlet connection to the lubrication channel; a pump operatively connected to the inlet passageway for feeding a lubricant under pressure to the lubrication channel; an outlet passageway through the stub shaft providing an outlet connection to the lubrication channel; an outlet conduit connected to the outlet passageway; a pressure switch responsive to the pressure on the lubricant in the outlet conduit for starting and stopping the pump to maintain the pressure on the lubricant without preselected limits.



3,867,058

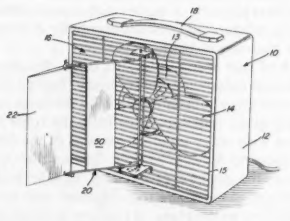
MOTION IMPARTING APPARATUS

Ray V. Hendrickson, 816 Dogwood Rd., North Palm Beach, Fla. 33403

Filed Dec. 1, 1972, Ser. No. 311,141

Int. Cl. F01d *7/00*; **F03d** *5/06*; **F01d** *9/00*

U.S. Cl. 415—125 **9 Claims**



1. Apparatus for imparting motion, comprising a pivotally mounted member arranged in a fluid stream, the member including:

a. an arm having a pair of spaced ends, and pivotally mounted at a one of the ends;

b. an airfoil pivotally connected to the other of the ends, the arm and airfoil arranged for pivoting about substantially vertical axes between two extreme end positions and the airfoil arranged for swinging the other of the ends, and the airfoil being arranged for changing positions relative to the arm and the fluid stream as the arm approaches each end position for changing the direction of swinging movement of the airfoil; and

c. stop means for causing the other of the ends and the airfoil to engage one another and determine the angle of the airfoil relative to the arm and the fluid stream in each position of the airfoil.

3,867,059

REVERSIBLE MULTI-STAGE HYDRAULIC MACHINE

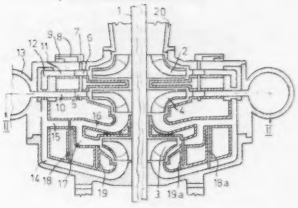
Michel Fauconnet, Geneva, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Oct. 29, 1973, Ser. No. 410,898

Claims priority, application Switzerland, Oct. 31, 1973, 15846/73

Int. Cl. F01d *13/02*, *1/30*, *1/00*

U.S. Cl. 415—153 **5 Claims**



1. A reversible hydraulic machine including

a. a pump-turbine part having at least two stages, and a pump part having at least one stage,

b. each stage including an impeller, and the impellers being coupled to a common shaft,

c. the impellers of said two stages of the pump-turbine part being arranged in juxtaposition and back-to-back with their suction apertures facing in opposite directions;

d. two sets of distributors with adjustable stator blades, one being associated with each of said two stages of the pump-turbine part;

e. common regulating means for simultaneously adjusting the setting of both sets of blades; and

f. passage means interconnecting the stages and containing obturator means for selectively putting out of action the pump part,

g. the obturator means having a first setting in which it causes water being pumped to flow from a suction tube to a spiral casing of the machine through a path which leads serially through one stage of the pump-turbine, the pump, and the other stage of the pump-turbine, and a second setting in which it causes water acting as power medium to flow from the spiral casing to the suction tube of the machine through a part which leads serially through said two stages of the pump-turbine part and is isolated from the pump part.

3,867,060

SHROUD ASSEMBLY

Thomas R. Huber, Waterford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,455

Int. Cl. F01d *5/20*

U.S. Cl. 415—172 A **3 Claims**

1. In a turbomachine, including a rotor axially disposed within a unitary outer casing, said rotor formed with a plurality of radially extending rotor blades, each blade having at least one radially extending seal tooth; and, said outer casing being formed with an open end annular recess circumferentially adjacent said rotor blades seal teeth; a shroud assembly comprising:

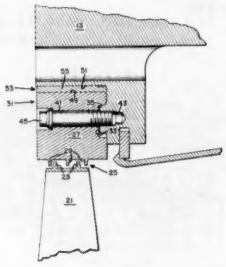
a plurality of shroud segments disposed in said open end annular recess;

at least one shroud seal tooth radially dependent from each shroud segment and overlapping a blade seal tooth in the axial direction to form an axial seal therewith; and,

a clearance defined between a radially outer surface of each shroud segment and a radially inner surface of said outer casing whereby each shroud segment may be moved

radially outward to unlap respective blade and shroud teeth prior to axial removal from the outer casing;

an annular stop formed on said outer casing extending axially into said annular recess; and,



a recess formed in each shroud segment for engaging a portion of said annular stop.

3,867,061

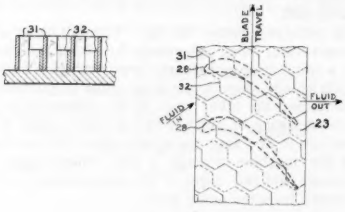
SHROUD STRUCTURE FOR TURBINE ROTOR BLADES AND THE LIKE

Seymour Moskowitz, Fort Lee, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Dec. 26, 1973, Ser. No. 427,652

Int. Cl. F01d *11/08, 11/00*

U.S. Cl. 415—174 **6 Claims**



1. In a fluid flow device having a rotor with generally radially extending blades coacting with fluid flowing between the blades, a shroud structure circumferentially surrounding the tips of the rotor blades in close proximity thereto to minimize leakage of fluid across the blade tips, the gap between the blade tips and the apposed surface of the shroud structure having in the cold state of the device a radial dimension which may diminish during operation sufficiently to cause rubbing contact between the blade tips and the shroud, the improvement comprising:

a. the shroud having a plurality of strips convoluted in a semi-hexagonal configuration in their longitudinal direction, each of the strips having one edge affixed to a rigid backing element and its opposite edge freestanding in the radial direction and apposed to the blade tips,

b. the strips being disposed with their convoluted length approximately parallel to the chordal centerline of the rotating blade tips,

c. the freestanding edges of the strips being resilient to rubbing contact with the blade tips in the generally circumferential direction of the shroud and generally transversely to the convoluted longitude of the strips.

3,867,062

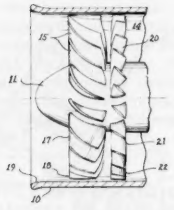
HIGH ENERGY AXIAL FLOW TRANSFER STAGE

Theodor H. Troller, Ava Banch, Portal, Ariz. 85632

Continuation-in-part of Ser. No. 183,413, Sept. 24, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,654

Int. Cl. F04d *29/32*

U.S. Cl. 415—194 **3 Claims**



1. In a fluid flow apparatus including a rotor, the axis of which extends along the direction of fluid flow, and having a housing surrounding said rotor, said housing extending along said rotor and radially spaced therefrom to define a fluid passageway between said rotor and housing a fluid energy boosting stage comprising:

a first plurality of circumferentially spaced energy adding blades secured to said rotor for movement in a plane of rotation, each having a leading edge and a trailing edge and each extending radially therefrom to adjacent said housing;

each of said first plurality of blades having substantially airfoil sections with the section at the blade root positioned relative to the plane of rotation of said blades such that a line extending from the leading to the trailing edge forms an angle with the plane of rotation that becomes progressively less at cross sections further from the blade root;

a second plurality of circumferentially spaced energy adding blades secured to said rotor for movement in a plane of rotation, each having a leading edge and a trailing edge and each extending radially therefrom for rotation with said first plurality of blades said second plurality of blades being substantially circumferentially displaced from said first plurality of blades;

each of said second plurality of blades shaped and positioned independently from said first plurality of blades and having substantially airfoil sections, said sections at any given radial distance from the rotor axis cooperating with corresponding sections of the first plurality of blades to deflect the fluid flowing through the apparatus, the section of each of said second plurality of blades at the blade root adjacent said rotor positioned relative to the plane of rotation of said blades such that a cord line extending from the leading to the trailing edge forms an angle of greater than 90° with the plane, with the trailing edge pointing toward the direction of rotation of the blade, said angle becoming progressively less at sections further from the blade root.

the trailing edges of said first plurality of blades being angled with respect to the leading edges of said second plurality of blades.

3,867,063

STATOR OF MULTISTAGE TURBOMACHINE

Eduard Grigorievich Bulavin, Prospekt Lenina, 21, Kv. 11, and Jury Evgenievich Sljusarev, Ulista 8 Mauta, 66, Kv. 23, both of Zaporozhie, U.S.S.R.

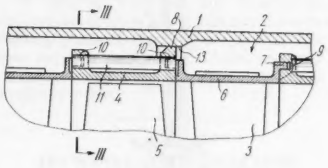
Filed Oct. 18, 1972, Ser. No. 298,631

Int. Cl. F01d *1/02, 9/00*

U.S. Cl. 415—198 **4 Claims**

1. A stator of a multistage turbo-machine comprising:

a housing of a turbo-machine;
a guiding device of each stage of the turbo-machine accommodated in said housing and including an external ring and fixed blades secured to said external ring;
a working ring of each stage fixed in said housing;
annular shoulders for limiting radial displacement of said working ring relative to said external ring, one shoulder being made at each end face of said external ring;
an annular groove at each end face of said working ring, said groove enclosing said shoulder of said external ring; and

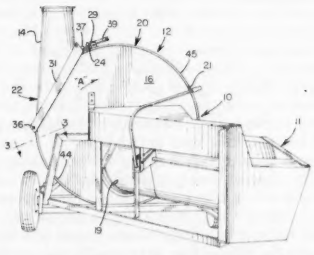


limiting means for limiting the circumferential displacement of said working ring relative to said external ring, said limiting means comprising:
a plurality of studs spaced along a circle, rigidly secured in each said working ring and extending substantially axially through said working ring, opposite ends of each stud being substantially located in correspondence annular grooves at opposite faces of said working ring;
a plurality of axial slots in said shoulders of said external ring, each of said slots receiving one end of one of said studs and the longitudinal axis of said stud extending within each said slot.

3,867,064
FORAGE BLOWER OUTLET

Robert Sorensen, Glen Ellyn; Thomas J. Scarnato, Barrington, and N. Donald Patterson, Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 27, 1973, Ser. No. 392,155
Int. Cl. F04d *29/40*
U.S. Cl. 415—201 **5 Claims**

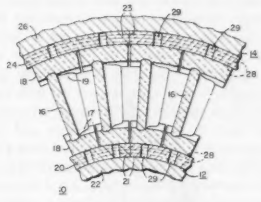


1. In a housing for a forage blower, said housing comprising a pair of laterally spaced side sheets, one of said side sheets having a crop inlet, and an annular peripheral wall adapted to be clamped against said side sheets, said peripheral wall comprising outlet means and a circumferential band, the improvement wherein said outlet means comprises a base member connected in end to end relationship with said band, said base member, side sheets, and circumferential band defining an opening in said peripheral wall adjacent the periphery of said side sheets, and a blower outlet having a portion removably attached to said base member, said blower outlet being displaceable from said base member to permit access to the interior of said housing while said peripheral wall remains clamped against said side sheets.

3,867,065
CERAMIC INSULATOR FOR A GAS TURBINE BLADE STRUCTURE

Richard J. Schaller, Ambler, Pa.; Thomas J. Rahaim, Claymont, Del., and Claude R. Booher, Jr., West Chester, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 16, 1973, Ser. No. 379,677
Int. Cl. F01d *9/02*
U.S. Cl. 415—214 **2 Claims**

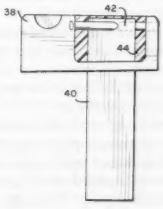


1. A hot elastic fluid stator blade construction for a gas turbine, comprising a plurality of radially directed stationary ceramic blades disposed across an annularly shaped hot fluid flow path, each of said stationary ceramic blades being supported on their radially inner ends by a ceramic inner end cap, each of said stationary ceramic blades being supported on their radially outer ends by a ceramic outer end cap, said ceramic outer end caps defining a portion of the radially outer surface of said annularly shaped hot fluid flow path, said inner ceramic end caps defining a portion of the radially inner surface of said annularly shaped hot fluid flow path, and an arcuately shaped ceramic insulator disposed on the radially outer side of said outer ceramic end caps, and an arcuately shaped ceramic insulator disposed on the radially inner side of the inner ceramic end caps, said ceramic insulators preventing damage to said end caps from thermal distortion caused by uneven temperature distribution therein, said ceramic insulators having a woven fibrous ceramic material disposed therein.

3,867,066
GAS COMPRESSOR

Fred Canova, Phillipsburg; Leroy M. Krouse, and Hanns Hornschuch, both of Easton, all of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Division of Ser. No. 235,501, March 17, 1972, Pat. No. 3,773,430. This application Aug. 1, 1973, Ser. No. 384,450
Int. Cl. F01d *1/02, 5/00, 25/04*
U.S. Cl. 415—217 **3 Claims**

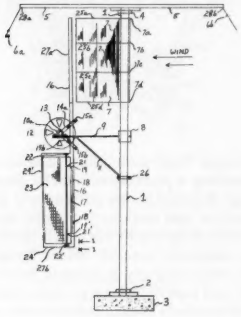


1. An arrangement for mounting stator vanes in a stator housing, for use in a gas compressor, comprising:
a vane mounting ring, said ring having a recess formed therein for receiving a vane therewithin;
a vane having an end thereof disposed within said recess, with a pin therethrough securing said vane end to said ring and in said recess; and
resilient means enveloping said vane end in said recess and dampening said vane against vibration.

3,867,067
WIND POWERED MOTIVE APPARATUS

Edwin K. Hillman, 907 W. Desert Cove Rd., Phoenix, Ariz. 85029

Filed Sept. 6, 1973, Ser. No. 394,786
Int. Cl. F03b 7/00
U.S. Cl. 416—10 8 Claims



1. A wind operated apparatus having a rotatable output shaft, said apparatus comprising:

a. a mast, said mast being pivotally mounted;

b. a triangular shaped deflector, said deflector being rigidly attached to said mast, said deflector in combination with said mast being pivotally responsive to any changes in the direction of the wind to orient an apex of said deflector into the wind, whereby the lateral sides extending from the apex laterally deflect the wind;

c. support means attached to said mast and extending laterally therefrom;

d. said output shaft being rotatably mounted upon said support means normal to a plane bisecting the apex of said deflector, said output shaft extending beyond opposed sides of said deflector; and

e. a plurality of vane means displaced from one another and extending from said shaft, each said vane means including:

1. a common pipe affixed at its center to said shaft and extending laterally therefrom;

2. a pair of vanes having one vane secured to each extending part of said common pipe, one vane of said pair of vanes being oriented at right angles to the other vane;

3. bearing means disposed at the junction of said shaft and said common pipe to rotatably journal said common pipe; and

4. means for limiting rotational movement of said pair of vanes within a 180° arc facing away from said deflector;

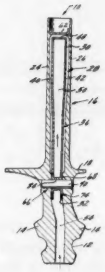
f. power take off means attached to said output shaft;

whereby, said deflector aligns said vane means for rotation within a plane parallel to the wind, each said vane means presenting an asymmetrical surface area to the wind to induce rotation of said output shaft, said deflector further producing a lateral component to a part of the wind acting upon said vane means to prevent a stalled condition of said vane means.

3,867,068
TURBOMACHINERY BLADE COOLING INSERT RETAINERS

Robert J. Corsmeier; Charles E. Corrigan, and Ronald E. Dennis, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 30, 1973, Ser. No. 346,422
Int. Cl. F01d 5/18
U.S. Cl. 416—97 15 Claims



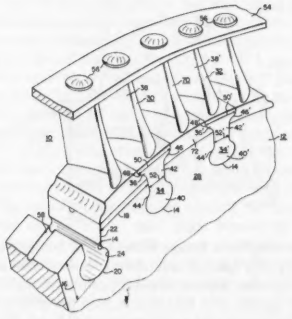
1. In a turbomachinery blade of the type including a root portion, a blade platform, a hollow body portion defining an internal cavity, at least one thin-walled, hollow insert adapted to be positioned within said hollow body portion, and means for delivering a coolant to the interior of said insert, the improvement comprising:

means for mechanically securing said insert to said hollow body portion, said securing means including a bushing adapted to be secured to said insert, and pin means adapted to be secured to both said bushing and to said blade.

3,867,069
ALTERNATE ROOT TURBINE BLADING

Kenneth J. Bussell, San Jose, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 4, 1973, Ser. No. 357,436
Int. Cl. F01d 5/30
U.S. Cl. 416—212 8 Claims



1. A rotor for axial flow elastic fluid turbine apparatus comprising:

a shaft member having a plurality of axial grooves disposed circumferentially about the periphery thereof and having a surface area thereon, said grooves being a predetermined circumferential distance from each other,

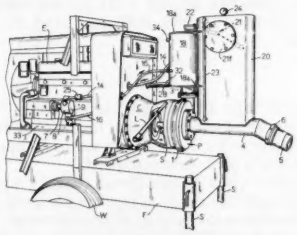
a first rooted blade disposed in one of said plurality of axial grooves, said first rooted blade having a platform portion thereon;

a second rooted blade disposed in an adjacent axial groove, said second rooted blade having a platform portion thereon,;

a rootless blade having a platform portion thereon, said platform portion having an underside surface thereon, said underside surface of said platform portion of said rootless blade directly abutting said surface area on said shaft member, said platform portion of said first rooted blade and said platform portion of said second rooted blade contacting said platform portion of said rootless blade to radially secure said rootless blade in position against said shaft member and,

means for damping relative motion between said rooted blades and said rootless blade, said means comprising said contacting platform portions adapted so that relative motion between said rooted blades and said rootless blade generates a friction force therebetween to dampen said relative motion.

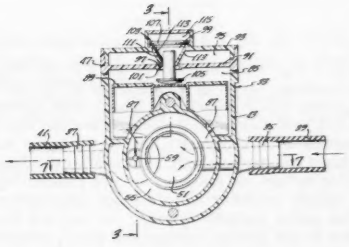
3,867,070
JET WATER PUMP APPARATUS
Albert H. Sloan, 4201 Kean Rd., Ft. Lauderdale, Fla. 33314
Filed June 28, 1973, Ser. No. 374,343
Int. Cl. F04b *49/04;* **F04d** *9/00*
U.S. Cl. 417—34 **10 Claims**



1. Self-priming jet type water pump apparatus comprising a power source, a water pump connected to and driven by said power source, water inlet means for said pump, a priming tank in fluid receiving communication with said water inlet water means, a safety chamber, an air line placing said priming tank in communication with said safety chamber; a vacuum pump driven by said power source and having an air inlet conduit connected to said safety chamber whereby said vacuum pump can draw a vacuum from said safety chamber, said airline and consequently from said priming tank to thereby create a vacuum in said priming tank which causes water to be drawn up into said priming tank from said water inlet means; a float type valve mounted in said priming tank and actuated by water level of a predetermined height in said priming tank to close said air line to said safety chamber and consequently shut off the vacuum in said priming tank, a float switch in said safety chamber and having a connection to said power source for shutting off said power source when water enters said safety chamber from said priming tank and rises in said safety chamber to a predetermined level, a separator tank, a conduit connecting said vacuum pump with said separator tank whereby said vacuum pump can deliver a mixture of air and oil to said separator tank for separating air from said oil.

8. A mobile self-priming jet type water pump apparatus comprising a mobile frame having ground wheels for transporting said apparatus, an internal combustion engine, said engine having a fuel valve, a disengagable clutch connected directly to said engine, said clutch having an output shaft, a water pump connected directly to and driven by said clutch outtput shaft, a water inlet pipe extending rigidly from said pump and for conducting water to said pump, said pump having a discharge end and a check valve in said discharge end for sealing the latter against entry of air when said pump is inoperative, a priming tank rigidly mounted on and in fluid communication with said water inlet pipe, a safety chamber rigidly mounted on said priming tank, an air line between and in communication with the upper end of said priming tank and the upper end of said safety chamber, a vacuum pump mounted on and driven directly by said engine and having an air inlet conduit connected to and in communication with the upper end of said safety chamber whereby said vacuum pump draws a vacuum in said safety chamber through said air line and consequently in said priming tank to thereby create a vacuum in said priming tank which causes water to be sucked up into said priming tank from said inlet pipe, a float type valve mounted in the upper portion of said priming tank and actuated by water level of a predetermined height in said priming tank to close said air line to said safety chamber and consequently shut off the vacuum in said priming tank, a float switch in said safety chamber and having an electrical connection to said fuel valve for shutting off said fuel valve and consequently said engine when water enters said safety chamber from said priming tank and rises in said safety chamber to a predetermined level, a separator tank, said vacuum pump having an outlet, a conduit connection between said outlet of said vacuum pump and separator tank for delivering a mixture of air and oil to said separator tank, said separator tank being mounted on said priming tank.

3,867,071
PUMPING SYSTEM WITH AIR VENT
Ezra D. Hartley, 2700 Jaemia Dr., Los Angeles, Calif. 90046
Filed Sept. 22, 1972, Ser. No. 291,284
Int. Cl. F04b *49/00;* **B01d** *19/00*
U.S. Cl. 417—211.5 **4 Claims**



1. A pumping system for pumping liquid comprising:

a housing having an inlet and an outlet, said inlet being connectible to a source of liquid;

a pump having a suction opening and a discharge opening, said pump being mounted in said housing for pumping liquid through said housing from said inlet to said outlet; wall means on said housing defining a float chamber in communication with the discharge opening of said pump, said wall means having a vent opening therein in communication with the exterior of said housing;

means for blocking said float chamber from direct communication with the suction opening of said pump whereby the only flow path between said float chamber and the suction opening is through the discharge opening;

a float in said float chamber movable in response to the liquid level in said float chamber;

a valve including a valve element movable between a closed position in which the valve element closes the vent opening and an open position in which the valve element allows flow through the vent opening;

said valve element being drivable toward at least one of said positions thereof by said float, said valve element closing said vent opening in response to a relatively high liquid level in said chamber and opening said vent opening in response to a lower liquid level in said chamber; and

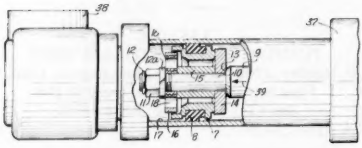
said vent opening being a first vent opening, said valve including a first valve element and a stem, said stem projecting through said first vent opening in both the open and closed positions, means defining a second vent opening in series with the first vent opening, a second valve element disconnected from said stem for closing the second vent opening, said second valve element including a disc.

3,867,072

VALVE DISTRIBUTOR PISTON ASSEMBLY FOR HIGH PRESSURE PUMP

Homer K. Brenneman, Delphi, Ind., assignor to Bremco Industries, Lafayette, Ind.

Filed Feb. 19, 1974, Ser. No. 443,693
Int. Cl. F04b *7/00*
U.S. Cl. 417—511 **3 Claims**



1. In a high pressure pump having a reciprocating piston rod, a cylinder having an internal diameter, forward and rear stop plates fixedly mounted in spaced apart relationship on said rod, said plates having outside diameters less than said cylindrical internal diameter, said forward stop plate being apertured and having a generally radially extending rear piston stop surface, and said rearward stop plate having a generally radially extending forward piston stop surface; an improved piston assembly mounted on said rod for slidable motion in said cylinder between said plates, comprising:

a. an inner rigid piston element having forward and rear body portions,

1. said rear body portion including inner front and rear generally radially extending stop surfaces axially spaced apart a distance less than the distance between said stop plates;
2. said rear body portion also having an inner diameter less than the diameter of said stop plates between the said inner piston front and rear stop surfaces;
3. said inner piston further having a forward portion extending forwardly of said piston front stop surface;
4. said inner piston forward portion extending between the outer diameter of said forward stop plate and said cylinder internal diameter when said inner piston rear stop surface abuts said rearward stop plate forward stop surface;
5. said inner piston forward portion also having an internal diameter slightly greater than said outer diameter of said forward stop plate and an outside diameter slightly less than said cylindrical internal diameter;
6. said rear body portion of said inner piston having an outer circumferential channel;

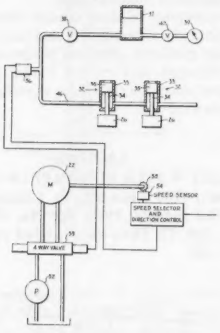
b. an outer piston element mounted in said inner piston channel, said outer piston element being resilient, and extending between said channel and said cylinder in a compressed state to effect piston sealing and centering functions during operation of said pump.

3,867,073

CONTROL FOR FLUID MOTOR

John C. Barrett, Minneapolis, and Roger L. Larson, Waconia, both of Minn., assignors to Raygo, Inc., Minneapolis, Minn.

Division of Ser. No. 290,531, Sept. 20, 1972, Pat. No. 3,814,532. This application Jan. 3, 1974, Ser. No. 430,503
Int. Cl. F01c *21/12*; **F03c** *3/00*; **F04c** *15/02*
U.S. Cl. 418—40 **2 Claims**



1. A control for a fluid motor, comprising:

A. motor speed selecting means for effecting connection of the motor with a fluid pressure source for operation of the motor at a predetermined speed;

B. a motor speed sensing device coacting with the motor speed selecting means to regulate the speed of the motor and maintain the same at its selected value;

C. means driven by the motor for producing fluid pressure of a magnitude that varies with the speed of the motor, said means comprising

1. eccentric mass means driven by the motor for rotation about an axis; and
2. a hydraulic system including means to resist centrifugal force acting on said eccentric mass means during rotation thereof, and in which hydraulic pressure is developed by the response of the eccentric mass means to centrifugal force; and

D. means rendered operative in consequence of rise in said pressure beyond a predetermined magnitude for effecting cessation of fluid flow to the motor so that in the event of failure of any portion of said motor speed regulating means the motor stops.

3,867,074

SIDE SEAL MECHANISM FOR ROTARY PISTON ENGINE

Yoshio Uchiyama, Nuriyuki, Kurio, both of Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Aki-gun, Hiroshima-ken, Japan

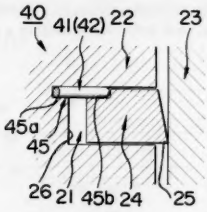
Filed May 8, 1973, Ser. No. 358,269
Claims priority, application Japan, May 11, 1972, 47-55422
Int. Cl. F01c *19/00*; **F04c** *15/00*, *27/00*
U.S. Cl. 418—142 **9 Claims**

1. A side seal mechanism for use in a side seal groove which is formed in a side surface of a rotor rotatably received within an engine housing of a rotary piston engine, comprising:

a side seal member sized and shaped to be slidably received in the side seal groove of said rotor and having its axially outer end slidably contacting an axially inner side wall of said engine housing to provide sealing inbetween;

a guide groove formed in at least one of the bottom wall of said seal groove and said side seal member, said guide groove being located at one of the radial extremities of

said side seal groove and being rectangular in shape; and a wire spring received in said guide groove for biasing said seal member toward said axially inner side wall of said



engine housing, said wire spring having a plurality of alternate axial projections lying only in the axial direction with respect to said rotor.

3,867,075

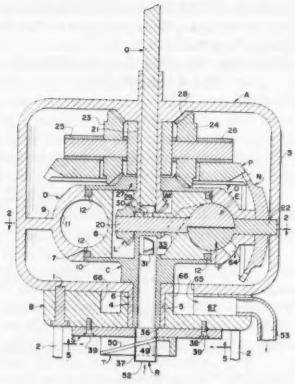
ROTARY ENGINE WITH ROTATABLE THRUST HEADS IN A TOROIDAL CHAMBER

Tallmon E. Horst, Saratoga, Calif., assignor to Horst Power Systems, Inc., Saratoga, Calif.

Filed July 22, 1974, Ser. No. 490,400

Int. Cl. F01c *1/00;* **F03c** *3/00;* **F04c** *17/00*

U.S. Cl. 418—172 **14 Claims**



1. A rotary engine comprising:

a. a pair of inner and outer members, at least one of which is rotatable with respect to the other about a common axis;

b. the inner member having an outer circular periphery and the outer member having an inner circular periphery that slidably contacts the outer periphery of the inner member, the inner member having a semi-toroidal groove formed in its outer periphery and the outer member having a complementary semi-toroidal groove formed in its inner periphery and facing the semi-toroidal groove in the inner member to form a complete toroidal chamber therewith;

c. a first thrust head carried by the inner member and receivable in the toroidal chamber, the first thrust head having a shaft which is rotatable in the inner member;

d. a second thrust head carried by the outer member and receivable in the toroidal chamber, the second thrust head having a shaft which is rotatable in the outer member;

e. a first pair of arcuate-shaped inserts, one insert being disposed on each side of the first thrust head to form a first pocket and each being secured to the inner member, the inserts having contoured surfaces extending from the first pocket and terminating in feathered edges that merge into the surface of the toroidal chamber, the first thrust head being rotatable receivable in the first pocket;

f. a second pair of arcuate-shaped inserts, one insert being diposed on each side of the second thrust head to form a second pocket and each being secured to the outer member, the second pair of inserts having contoured surfaces extending from the second pocket and terminating in feathered edges that merge into the surface of the toroidal chamber, the second thrust head being rotatably receivable in the second pocket;

g. means for operatively connecting the inner and outer members together so that at least one of them is rotatable with respect to the other and for rotating the thrust heads so as to continuously close the cross-sectional area of the toroidal chamber and the restricted cross-sectional area caused by the inserts, the first and second thrust heads being rotated on their own axes so that they will pass each other during each revolution of the inner member relative to the outer member;

h. means for delivering an expansion fluid into the chamber portion lying between the first and second thrust heads for moving them apart;

i. means for exhausting the expansion fluid from that portion of the toroidal chamber lying between the first and second thrust heads in the direction in whcih they are moving relatively toward each other; and

j. output shaft means operatively connected to produce a driving torque from the relative rotational movement between the inner and outer members.

3,867,076

SCREW COMPRESSOR WITH ROTOR SECTIONS

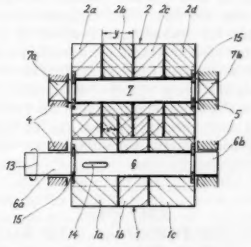
Walter Spindler, Munich, Germany, assignor to H & H Licensing Corporation, Miami, Fla.

Filed Jan. 17, 1974, Ser. No. 434,300

Claims priority, application Germany, Jan. 22, 1973, 2302902

Int. Cl. F04c *1/10*

U.S. Cl. 418—201 **10 Claims**



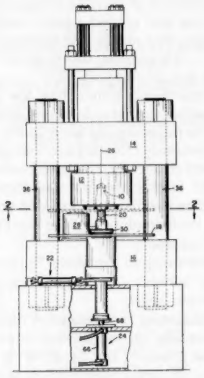
1. Screw compressor, screw pump, or the like, including a casing with spaced shaft means mounted therein and carrying cooperating rotors with intermeshing helical screw thread formations; each rotor comprising a group of individual rotor sections arranged in series axially along a corresponding shaft and presenting the intermeshing thread formations, the rotor sections of one group being axially offset relative to adjacent rotor sections of another group to provide axially lapping and meshing surface areas therebetween, a rotor section of one group being fixed to its associated shaft which is adapted to be driven from a drive mechanism for rotating the same, and the remaining rotor sections of each group being mounted for rotation independently of the associated shafts for transmission of torque from the shaft-fixed rotor section continuously through the next succeeding lapping and meshing sections of each group.

3,867,077

COMPACTING APPARATUS HAVING IMPROVED ROTATING TABLE MEANS FOR INDEXING MOLDS TO AND FROM A COMPACTING CHAMBER

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed May 15, 1974, Ser. No. 469,980
Int. Cl. B30b *5/02, 11/00*
U.S. Cl. 425—405 A **10 Claims**



1. In a powder compacting apparatus of the type which includes (a) a chamber for receiving a charge of powder material so that an isostatic force can be applied thereto, (b) a plurality of molds for containing the powder material while it is advanced into the chamber and subjected to an isostatic force, (c) a table means having a plurality of openings formed therethrough for receiving and supporting said plurality of molds, and (d) rotating means for indexing the table means about an axis of rotation, the improvements comprising:

lifting and lowering means operatively associated with said table means for moving the table means, along its axis of rotation, toward and away from said chamber so as to provide for an insertion and removal of said molds, one at a time, into and out of said chamber, and

blocking means for restraining movement of a mold out of said chamber after the mold is inserted into the chamber and when an isostatic force is applied to the mold, said blocking means being arranged to operate through said openings in the table means so that the table means and said lifting and lowering means can be moved out of supporting contact with a mold after the mold has been inserted into said chamber.

3,867,078

APPARATUS FOR FORMING A GOLF BALL MOLD

Carl D. Porter, El Monte, Calif., assignor to E. Victor Fried, Monrovia, Calif.

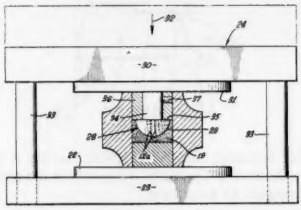
Division of Ser. No. 187,967, Oct. 12, 1971, Pat. No. 3,772,008. This application May 7, 1973, Ser. No. 357,944
Int. Cl. B22f *3/00;* **B29c** *1/00*
U.S. Cl. 425—78 **3 Claims**

1. Apparatus for forming a concavely hemispherical mold for use in molding one-half of a golf ball, and so that the mold interior surface is accurately dimpled, said apparatus including:

a. a forming die cylinder to receive a mass of powdered mold metal, the cylinder having a cylindrical bore and an axis,

b. a hemispherical punch having a convex one-half spherical exterior surface which contains multiple recesses corresponding to the mold surface dimples, the punch having an axis and being received coaxially endwise in the cylinder bore for advancement axially therein to urge said surface against the mass of powdered metal to consolidate that metal into mold shape with said surface dimpling,

c. structure in the cylinder to confine the mass during said consolidation, said structure including a plug removably



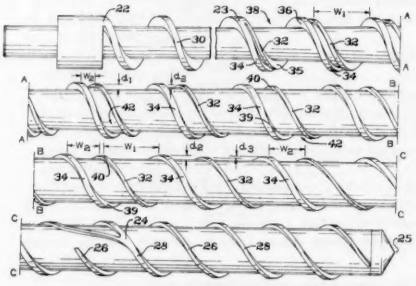
and slidably received in said bore to face endwise toward said punch surface so as to receive pressure application transmitted through the metal mass during mold consolidation, and including a stem integral with the punch to extend coaxially at the rear thereof, and a sleeve on the stem, the sleeve diameter exceeding the diameter of the punch base.

3,867,079

APPARATUS FOR EXTRUDING POLYMERIC MATERIAL

Heung T. Kim, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 10, 1972, Ser. No. 279,697
Int. Cl. B29f *3/02*
U.S. Cl. 425—208 **6 Claims**

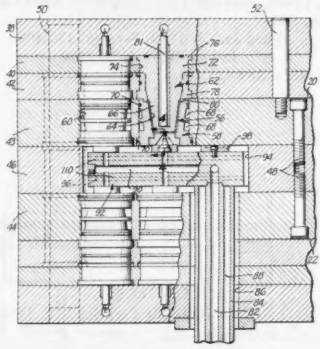


1. In a machine for processing polymeric material comprising a cylinder; said cylinder having die means at one end thereof; a feed screw rotatably mounted in said cylinder and extending longitudinally therethrough for moving plastic material therethrough to progressively change said plastic material from the solid phase to a fluent phase for extrusion therefrom; said feed screw having first means for operatively exerting continuous pressure on said plastic material for moving said plastic material; second means integral with said feed screw for continuously leading off the fluent phase progressively from said first means as the plastic material is changed from the solid phase by contact with said cylinder, said fluent phase being directed away from and not through the remaining solid phase; and said first means defines a groove having a constant axial width with decreasing radial depth in the direction of said die means providing a constant amount of surface area exposed to said cylinder for material carried by said groove.

3,867,080
INJECTION MOLD

Robert G. Bruder, 20160 E. Juanita St., Glendora, Calif. 91740

Filed Oct. 31, 1972, Ser. No. 302,493
Int. Cl. B29f 1/022
U.S. Cl. 425—247 16 Claims



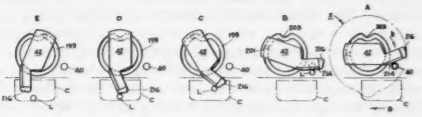
1. An injection mold comprising:
a mold body containing a mold cavity and a nozzle chamber opening at one end into said cavity through a gate opening in the cavity wall and including separable mold body sections movable relative to one another between closed positions for molding a part in said cavity and open positions for removing the molded part from the cavity and having a parting plane intersecting said cavity,
an injection nozzle in said chamber having a tip positioned within and smaller in diameter than said gate opening so as to define an annular injection orifice between said tip and the edge of said gate opening,
said nozzle containing passages opening to said chamber through which a molten molding medium is adapted to be injected into said chamber,
said molding medium flowing from said chamber into said mold cavity through said annular orifice, and
means movably supporting said nozzle on one mold body section for relatively free centering movement of the nozzle laterally of the axis of said gate opening by the pressure of the molding medium passing through said orifice to permit centering of said nozzle tip in said gate opening by said molding medium.

3,867,081
APPARATUS FOR DISPENSING PREDETERMINED QUANTITIES OF PLASTIC MATERIAL BY BLADE MEANS HAVING ROTATIONAL AND TRANSLATIONAL MOVEMENT

George Everett, Unionville, Conn., assignor to Gros-Ite Industries, Inc., Farmington, Conn.

Division of Ser. No. 224,757, Feb. 9, 1972, Pat. No. 3,782,329, which is a continuation-in-part of Ser. No. 91,665, Nov. 23, 1970, abandoned. This application Apr. 27, 1973, Ser. No. 355,163
Int. Cl. B29f 3/00; B29d 31/00
U.S. Cl. 425—295 7 Claims

1. Apparatus for dispensing predetermined quantities of plastic material or the like comprising a block having a discharge passage, means for feeding plastic material through the discharge passage, a blade mounted for rotational and translational movement in a plane perpendicular to and adjacent the exit end of the discharge passage, means for rotating the blade across the exit end of the discharge passage and for imparting coordinated translational movement to the blade so as to

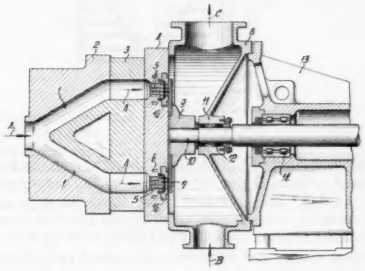


shear and direct the plastic material away from said exit end and means for biasing the blade against said block.

3,867,082
A GRANULATING DEVICE FOR GRANULATING SYNTHETIC PLASTICS MATERIAL IN A FLOWABLE STAGE

Friedrich Lambertus, Stuttgart, Germany, assignor to Werner & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed July 23, 1973, Ser. No. 381,763
Claims priority, application Germany, July 27, 1972, 2236823
Int. Cl. B29b 1/03; B29f 3/04
U.S. Cl. 424—313 9 Claims



1. A granulating device for granulating synthetic plastic material in a flowable stage, said device comprising:
a generally plate-shaped extrusion die having an inlet side and an extrusion side, said die including a plurality of nozzle bores extending crosswise through the die and an insulation layer interposed between the inlet side and the extrusion side of the die, said insulation layer being constituted by a coherent gap extending lengthwise substantially parallel to said bores encompassing the same and also parallel to the extrusion side of the die;
cooling means for cooling the extrusion side of said die;
cutting means movable parallel and adjacent to the extrusion side of the die for cutting material emanating from the extrusion side of the die to effect granulation of the material; and
feed means for pressure feeding material to be granulated to the inlet side of the die.

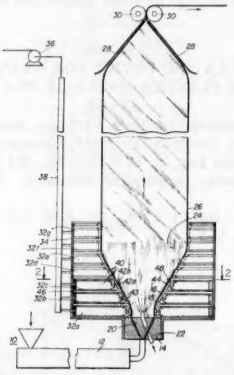
3,867,083
SHAPE IMPOSITION APPARATUS FOR THE EXTRUSION OF TUBULAR THERMOPLASTIC FILM

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed June 4, 1973, Ser. No. 366,388
Int. Cl. B29d 7/22
U.S. Cl. 425—326 R 5 Claims

1. In an apparatus for forming tubular thermoplastic film comprising extruder means; annular extrusion die means, adopted in combination to extrude a single tube of thermo-

plastic film; pinch rollers spaced downstream from said annular extrusion die adopted to flatten said tube; and means for introducing a fluid under pressure into said tube whereby to biaxially expand said tube and reduce the wall thickness thereof; the improvement, whereby reducing gauge nonuniformity in said film, which comprises a configuration imposition assembly comprising a diverging housing member, disposed concentric to, said extruded tube downstream of, and adjacent to, said annular die, said tubular thermoplastic film passing through said diverging housing member upon exiting from said die, said assembly being further characterized by



having multiple rows of channels therethrough, each of said channels terminating in an aperture on the inner surface of said housing, said apertures being arranged in a series of streamwisedly spaced pairs of diverging aperture rows adjacent to and directed towards said extruded tubing in an overall diverging shape, said streamwisedly spaced pairs of aperture rolls having individual apertures in one row of the pair which diverge from the adjacent apertures in the second row of the pair, means for forcing a fluid through said apertures towards said extruded tubing and then away from such tubing, whereby creating a suction and thus drawing said extruded tubing toward said assembly.

3,867,084

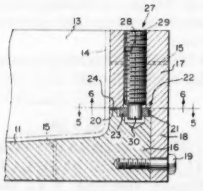
ADJUSTABLE MOLD

Frederick O. Miller, Saginaw, Mich., assignor to Miller Mold Company, Saginaw, Mich.

Filed July 30, 1973, Ser. No. 383,979

Int. Cl. B29d *7/22*

U.S. Cl. 425—383 **13 Claims**



1. A mold construction comprising a mold member having a cavity therein defined by a wall, said wall having an elongate groove therein opening into said cavity; flexible means having a length corresponding substantially to that of said groove and accommodated in said groove for movement inwardly and outwardly of said cavity; and a plurality of independently operable adjusting means engageable with said flexible means at longitudinally spaced apart intervals for adjusting selected portions of said flexible means inwardly and outwardly of said cavity.

3,867,085

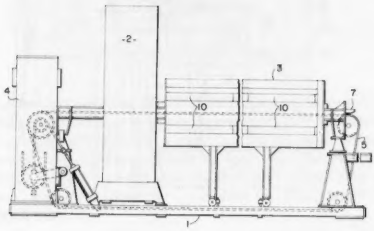
THERMOFORMING APPARATUS WITH WEB SUPPORT MEANS

John R. Lynch, Hartville, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Jan. 3, 1974, Ser. No. 430,408

Int. Cl. B29b *3/00, 5/04*

U.S. Cl. 425—384 **6 Claims**



1. Thermoforming apparatus comprising an elongated heating oven into one end of which a thermoplastic web is introduced for transport therethrough for heating said web to forming temperature; a thermoformer adjacent the other end of said oven into which the heated web is transported for forming therein; a conveyor operative to grip the opposite longitudinal edge portions of said web to convey said web through said oven and thermoformer for respectively heating said web to forming temperature and forming the web; sag inhibiting web support means in said oven extending longitudinally from such other end of said oven toward such one end and disposed underneath said web to support the latter between its longitudinal edge portions, said means comprising at least one elongated tube laterally spaced between said edge portions and having a series of openings through the wall thereof juxtaposed to the bottom surface of the web; and a fluid pressure source to supply gaseous medium into said tube for flow upwardly through said openings to impinge on the web thereabove thus to define a gas bearing to facilitate transport of the web through said oven while inhibiting sagging thereof.

3,867,086

APPARATUS FOR MOLDING A PLASTIC CONTAINER

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

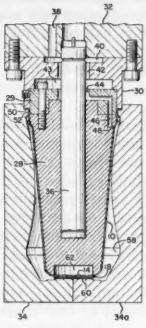
Filed Mar. 7, 1973, Ser. No. 338,774

Int. Cl. B29d *23/03*

U.S. Cl. 425—387 B **6 Claims**

1. Apparatus for molding a plastic container from a preform shaped to nest with others for shipment and storage with each preform having an open end portion of predetermined peripheral configuration and an opposite smaller end portion of predetermined configuration; and comprising a sectional female mold internally shaped according to the finished container to be reformed therein, a heated mandrel externally shaped substantially in accordance with the interior shape of the preform and insertable therewith into the female mold, means shielding both preform end portions against direct heat of the mandrel, means supporting the preform end portions against deformation during the reform shaping of the preform, and differential pressure means for reform shaping of the wall

of the preform between the shielded and supported end portions thereof to the reformed container configuration with



maintained integrity of the initial predetermined configurations of the said end portions.

3,867,087

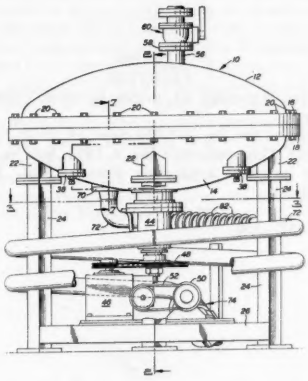
GAME BALL HEAT CURING APPARATUS

Douglas W. Bulson, Sylvania, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 405,601, Oct. 11, 1973,. This application Aug. 9, 1974, Ser. No. 495,972

Int. Cl. B29h *5/28*

U.S. Cl. 425—405 R **21 Claims**



1. Apparatus for heat curing a continuous series of spherical balls such as tennis balls, comprising:

A. a closed chamber adapted to provide a curing environment having a selected curing pressure;

B. circular molding means mounted within said chamber and defining a continuous molding groove of semicircular cross-sectional contour disposed in a spiral configuration across a flat surface from near the center to the edge of said molding means;

C. heating means disposed within said chamber and adapted to provide a selected curing temperature within said chamber for said molding means;

D. drive turntable means defining a circular flat drive surface disposed in parallel with and in selected proximity to said molding groove;

E. said turntable means being adapted when rotated to roll a series of said balls through said molding groove with said balls being in intimate contact with the semicircular contour of said molding groove;

F. means for rotating said turntable means;

G. inlet airlock means connected into communication with one end of said molding groove and adapted to transfer respective balls of a series of said balls from outside said chamber into rolling engagement within said molding groove;

H. cooling means connected in communication with the other end of said molding groove and adapted to receive said balls as are rolled out of said molding groove; and

K. an outlet airlock means connected in communication with said cooling means and adapted to transfer respective balls of a succession of said balls from said cooling means to outside said apparatus.

3,867,088

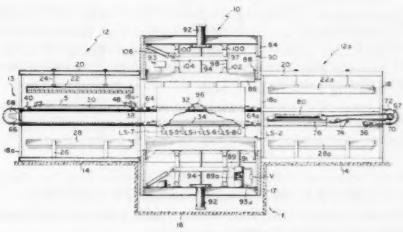
APPARATUS FOR FABRICATING A HOLLOW ARTICLE

Gaylord W. Brown, and George L. Pickard, both of Beaverton, Mich., assignors to Koehring Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 268,883, July 3, 1972, Pat. No. 3,787,158. This application Mar. 16, 1973, Ser. No. 342,094

Int. Cl. B29c *17/04, 27/12*

U.S. Cl. 425—504 **14 Claims**



1. Apparatus for forming a hollow article from sheets of deformable thermoplastic material comprising:

frame means with a forming station and a sheet heating station;

sheet heating means at said sheet heating station for heating sheets of deformable thermoplastic material;

carriage means on said frame supporting a pair of sheets of thermoplastic material for movement from said sheet heating station to said forming station;

mold assembly means at said forming station including a differential pressure mold member having a mold cavity for forming a shape in at least one of said sheets and an opposed member at least one of said members being mounted on said frame for movement toward and away from the other between a removed position and a sheet engaging position, and means for applying a differential pressure to opposite sides of said one sheet when said differential pressure mold member is in said sheet engaging position;

carrier means for moving article reinforcing means to a position between said members when said one member is in said removed position and depositing it on said one sheet;

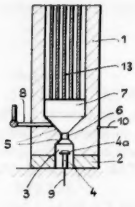
means for moving said one member toward the other member to fuse said sheets together and sandwich said reinforcing means between said sheets; and

means for separating said members.

3,867,089
APPARATUS FOR THE ELECTRICAL IGNITING OF LIQUID PROPELLENTS

Raimund Germershausen, Kaarst; Jochen Schmitt, Schiefbahn, and Wolfram Witt, Dusseldorf, all of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Dec. 20, 1973, Ser. No. 426,914
Claims priority, application Germany, Dec. 30, 1972, 2264332
Int. Cl. F23g 3/00
U.S. Cl. 431—263 5 Claims



1. A device for electrical ignition of liquid propellents comprising

an ignition charge housing defining an ignition charge space having at least two chambers of different size arranged in said ignition charge housing,

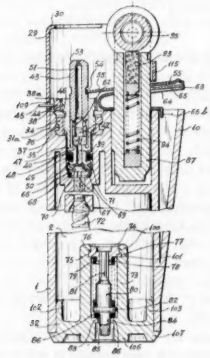
an electrode traversing centrally a smaller of said chambers constituting an electrode chamber and being connected with the adjacent of said chambers being of a larger volume and diameter, by means of an opening defining a housing constriction, and

a system of channels extending in the larger of said chambers.

3,867,090
REFILLABLE GAS CIGARETTE LIGHTER

Ricardo Aguirre Gili, Barcelona, Spain, assignor to Flamagas, S.A., Barcelona, Spain

Filed Oct. 26, 1972, Ser. No. 301,244
Claims priority, application Spain, Dec. 11, 1971, 175088
Int. Cl. F23q 1/02
U.S. Cl. 431—277 15 Claims



1. A refillable gas lighter, comprising:

a hollow main body;

said body supporting the following elements of which the lighter is comprised:

two spaced apart upstanding rises extending above and supported on said main body; each said rise having a respective vertical edge, and said rises being shaped and oriented such that said vertical edges face in the same direction as a lever extending out of said body; in each said rise is defined a pocket in the form of an open sided notch extending into said rise from its said vertical edge; said notches being of a width to permit swiveling of lever appendages held therein;

a reservoir in said body for holding fuel to be released; a fuel release valve in said body communicating with said reservoir and being operable to control release of fuel; said release valve including a labyrinth through which the fuel passes and which causes gasification of the fuel;

said lever engaging said release valve and extending out of said body; said lever extending between and passing between said rises; from opposite sides of said lever project said appendages which extend into and across said rise pockets and said appendages and said pockets being cooperatively shaped to enable said lever to be rocked around said appendages in said pockets; said release valve being shiftable by rocking of said lever to open said release valve;

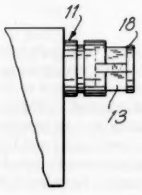
a return spring engaging said lever and applying force thereto for returning said lever and said release valve to the closed position;

an ignition mechanism in said body including means which enables said ignition mechanism to be readily mounted in said body; a pyrophoric flint held in said ignition mechanism; a knurled wheel for striking said flint; means for mounting said knurled wheel in said ignition mechanism; means in said body for establishing a leak-proof closing of said reservoir in said body.

3,867,091
LIGHTERS

Jean Gaston Malamoud, 61, Avenue de Novel, 74000 Annecy, France

Division of Ser. No. 291,830, Sept. 25, 1972, Pat. No. 3,807,941. This application Jan. 4, 1974, Ser. No. 430,611
Claims priority, application France, Sept. 13, 1971, 71.32944
Int. Cl. F23d 13/24
U.S. Cl. 431—350 2 Claims

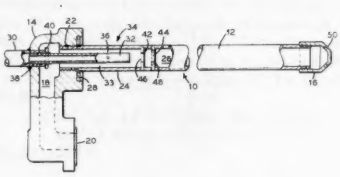


1. A gas lighter comprising a burner having a head with a single gas outlet, and a windshield mounted on said head and including radial partitions dividing the gas outlet into individual segments and a cover on said partitions extending perpendicular thereto at the top thereof.

3,867,092
IGNITOR

Warnie L. Sage, Louisville, and Edwin D. Scott, Alliance, both of Ohio, assignors to The Babcock and Wilcox Company, New York, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,187
Int. Cl. A62c 31/00; F23d 11/00
U.S. Cl. 431—354 5 Claims

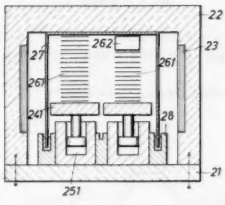


1. A liquid fuel fired ignition system comprising at least one ignitor, a device for atomizing the fuel preparatory to firing from the ignitor, said device including a nozzle having an inlet and an outlet end, a coupling connected to the inlet end, an inner tube disposed in said coupling and projecting into the nozzle through the inlet end thereof, said tube cooperating with the nozzle to define therebetween an annular passage of uniform dimension throughout, said tube having an outlet formed of at least one port opening into the passage and an inlet formed with a threaded portion, a sleeve mounted in the coupling, said sleeve having a threaded portion engaging the threaded portion of the tube while permitting rotatable and axial adjustment of said tube, means for supplying a liquid fuel to the passage and an atomizing fluid to the tube, the fuel being atomized by the fluid discharging from said port, and a pair of spaced perforated disks disposed within the nozzle downstream fuel flow-wise of said tube, the fuel being further atomized while passing through said disks.

3,867,093
HEAT TREATING APPARATUS

Bernhard Huttermann, Glinde, Germany, assignor to Jurid Werke GmbH, Glinde, Germany

Filed Oct. 1, 1973, Ser. No. 402,046
Claims priority, application Germany, Oct. 5, 1972, 2249194
Int. Cl. F27b 9/06, 3/04
U.S. Cl. 432—125 5 Claims



1. An apparatus for simultaneously treating substantially plate-shaped workpieces with heat and pressure comprising:

a hearth having surface means for the reception of workpieces to be treated, and cover means defining together with said surface means a treatment chamber;

said cover means having a portion extending substantially in parallel to, but spaced apart from said surface means;

heat generating means within said chamber;

ram means in cooperating relation with said surface means for moving said surface means under pressure in a direction towards said portion of said cover means and into said chamber to press the workpieces thereon against said cover means;

said surface means comprising a plurality of component surfaces and said ram means having an equal plurality of ram members;

each of said component surfaces being mounted in said hearth for independent movement by an associated one of said ram members; and

coupling means for releasably interconnecting at least two component surfaces of said plurality of component surfaces, said interconnected component surfaces being uniformly movable by their associated members.

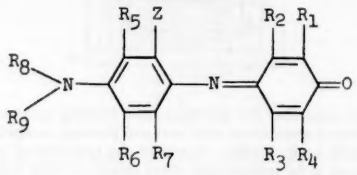
3,867,094
DYEING KERATINOUS FIBERS WITH DYE COMPOSITIONS CONTAINING INDOANILINES

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Dec. 29, 1971, Ser. No. 213,750
Claims priority, application Luxembourg, Dec. 30, 1970, 62348
Int. Cl. D06p *3/04*
U.S. Cl. 8—10 8 Claims

1. A dye composition for keratinous fibers comprising an aqueous solution of an indoaniline selected from the group consisting of

a. an indoaniline having the formula



wherein R_1, R_2, R_3 and R_4 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and halogen with the proviso that 1–2 of R_1, R_2, R_3 and R_4 are other than hydrogen; R_5, R_6 and R_7 each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–6 carbon atoms; R_8 represents a member selected from the group consisting of hydrogen and lower alkyl having 1–6 carbon atoms; R_9 represents a member selected from the group consisting of hydrogen and lower alkyl having 1–6 carbon atoms and together with R_8 and the nitrogen atom to which R_9 is attached form dihydro-oxazine; and Z represents a member selected from the group consisting of amino, acetylamino and hydroxy,

b. the hydrochloride of said indoaniline in (a) and

c. a double chloride of zinc and said indoaniline in (a), said indoaniline being present in amounts of 0.002–2 percent by weight of said composition.

3,867,095
SHRINKPROOFING OF WOOL WITH CYCLIC ACID ANHYDRIDES AND ZINC ACETATE

Nathan H. Koenig, Albany, and Mendel Friedman, Moraga, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 16, 1973, Ser. No. 342,135
Int. Cl. D06m *3/02*, *13/00*
U.S. Cl. 8—128 R 5 Claims

1. A process for chemically modifying wool, thereby increasing its resistance to shrinkage, which comprises

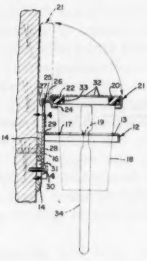
a. reacting wool under essentially anhydrous conditions, in the presence of N,N-dimethylformamide, with a cyclic acid anhydride, at a temperature about from 25° to 135°C. until the wool combines with about from 1 to 35% of its weight of the acid anhydride, and

b. reacting the so-modified wool, in the presence of N,N-dimethylformamide, with a compound selected from the group consisting of zinc acetate and cadmium acetate at a temperature about from 25° to 135°C. until there is attained a weight increase by the wool of about from 5 to 35%.

3,867,096
GLASS AND TOOTHBRUSH STERILIZATION AND SUPPORTING ATTACHMENT

Carl J. Doucette, 1649 Sarah Dr., Pinole, Calif. 94564

Filed Dec. 21, 1973, Ser. No. 427,112
Int. Cl. A61l *1/00*, *3/00*, *9/04*
U.S. Cl. 21—78 5 Claims

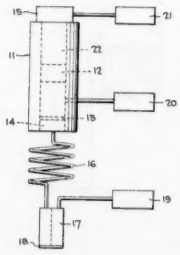


1. A device for sanitizing a drinking glass and the like comprising: a support for releasably retaining a drinking glass in a fixed position with the rim uppermost and above said support; a cover member movable from a lower position over the rim of the drinking glass to a raised position removed therefrom and permitting removal of the drinking glass from said support; hinge means having a hinge pin and a pair of hinge leaves pivotally connected by said pin, one of said leaves being secured to the cover member, said support having a socket for releasable reception of the other leaf of the hinge; means for simultaneously retaining said other leaf in a selected vertical position in said socket and for fixing the distance between said support and said cover member wherein various sized drinking glasses are held in the device and a disinfecting cartridge releasably carried by said cover member and having a portion thereof positioned to engage the rim of the drinking glass when said cover member is in its lower position.

3,867,097
MEASUREMENT OF CARBON DIOXIDE

Gerald G. Vurek, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed May 4, 1973, Ser. No. 357,272
Int. Cl. G01k *17/00*; G01n *25/20*, *33/16*
U.S. Cl. 23—254 E 4 Claims



1. Apparatus for quantitatively determining the carbon dioxide content in a gas comprising:

a. a sampling and separating means for selectively separating the carbon dioxide from any other components in said gas,

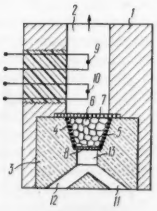
b. a reactor vessel containing a basic material which is reactive with the separated carbon dioxide,
c. a thermopile for measuring the heat generated by the reaction of the carbon dioxide with the basic material, said thermopile being in thermal contact with the basic material, and
d. means for transporting the separated carbon dioxide from the sampling and separating means to the reactor vessel.

3,867,098

GAS ANALYZER DETECTOR

Boris Konstantinovich Gorkovenko, Peremyshelsky, Pereulok, 6, kv. 15; Alexandr Mikhailovich Mikhailovsky, Peremyshelsky, pereulok, 6, kv. 16; Valentina Dmitrievna Churilova, ulitsa Gogolevskaya, 43a, kv. 34, and Olga Georgievna Kirillova, ulitsa Saxagonskogo, 15, kv. 16, all of Kiev, U.S.S.R.

Filed Apr. 11, 1973, Ser. No. 350,159
Int. Cl. G01n *25/20, 31/12, 27/16*
U.S. Cl. 23—254 E **1 Claim**



1. A gas analyzer detector comprising a sorption chamber widening in the direction of the flow of a gas mixture to be analyzed fed to the inlet thereof; a heating coil arranged in immediate proximity to the wall of said sorption chamber, covering almost all of its length; a sorbent which fills said sorption chamber; a reaction chamber placed at the outlet of said sorption chamber; a pair of thermal elements, the first of said elements being catalytic, whereon combustible components are burnt, and the second of said elements being non-catalytic with respect to combustible components of the gas mixture to be analyzed and so connected in the measuring circuit to compensate for changes in resistance in said first element not caused by the heat of the catalytic oxidation of combustible components, both elements being placed in said reaction chamber and connected to a circuit for measuring the concentration of combustible components in the gas mixture being analyzed.

3,867,099

BREATH SAMPLE TUBE AND METHOD OF MAKING IT

Macquorn R. Forrester, St. Louis, Mo., assignor to Intoximeters, Inc., St. Louis, Mo.

Filed Feb. 5, 1973, Ser. No. 329,656
Int. Cl. B01l *3/00*
U.S. Cl. 23—259 **6 Claims**

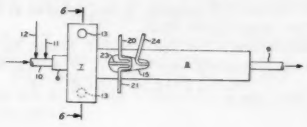
1. A capsule for receiving breath samples, comprising an indium tube, the inner wall of which is passivated with polyethylene glycol.

3,867,100

CARBON BLACK PRODUCTION APPARATUS

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 223,543, Jan. 28, 1972, abandoned. This application Jan. 29, 1974, Ser. No. 437,654
Int. Cl. C09c *1/48;* **F23c** *5/06*
U.S. Cl. 23—259.5 **8 Claims**



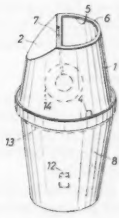
1. A carbon black reactor comprising:
a. a mixing section adapted with an upstream closing wall and with conduit means for the introduction of reactants thereinto;
b. a reaction section positioned downstream of and in open communication with said mixing section and adapted with conduit means for the recovery of carbon black from said reactor;
c. a choke positioned in said reaction section, said choke having a "teardrop" configuration, said choke being adapted with a plurality of conduit means extending into said choke, at least one of said conduit means discharging upstream of said choke and at least one of said conduit means discharging downstream of said choke.

3,867,101

TOILET CLEANSING DEVICE

Desmond Edward Herring, Ipswich, England, assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 6, 1973, Ser. No. 394,700
Claims priority, application Great Britain, Sept. 13, 1972, 42423/72
Int. Cl. B01d *11/02*
U.S. Cl. 23—267 A **9 Claims**



1. A device for dispensing a quantity of water-soluble material to a flushing cistern comprising:
A. A container for immersion in the water of a flushing cistern said container being comprised of an upper part and a lower non-permeable part;
B. At least one aperture defined in the top of said upper part;
C. At least one aperture defined in the side of said upper part;
D. A water soluble tablet containing a dyestuff supported at the bottom of said lower part; said tablet being adapted to permit rapid solution of the said dyestuff upon contact with water;

E. A water-soluble material selected from the group consisting of solid and pasty disinfecting and cleaning materials supported in said lower part covering said tablet;

whereby in use water passing through said apertures first dissolves and carries away said water soluble material and then dissolves and carries away the material of said tablet whereby the exhaustion of said water soluble material is evidenced.

3,867,102

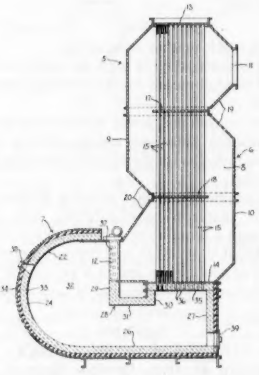
FUME INCINERATOR

Denis G. Csathy, Minneapolis, Minn., assignor to Deltak Corporation, Minneapolis, Minn.

Continuation of Ser. No. 236,361, March 20, 1972, abandoned. This application May 28, 1974, Ser. No. 474,093

Int. Cl. F01n *3/12;* **F23g** *7/06*

U.S. Cl. 23—277 C **3 Claims**



1. An incinerator by which fumes and particulate matter carried in gas to be treated can be rendered inoffensive, and which comprises a combustion chamber in which gas to be treated is subjected to a high temperature, and a preheater in which gas to be treated, flowing towards the combustion chamber, is passed in indirect heat exchange relation with hot gas issuing from the combustion chamber, said incinerator being characterized by:

A. the preheater comprising

1. means defining an elongated passage having opposite end walls and having near one of its end walls a laterally opening inlet for gas to be treated and having near its other end wall a laterally opening outlet for preheated gas to be treated, and
2. a plurality of substantially straight tubes extending lengthwise in said passage and through said end walls, through which tubes heated gas from the combustion chamber can flow for heat exchange with gas flowing from said inlet to said outlet across the exterior of the tubes;

B. means defining an axially short burner zone through which said outlet is substantially directly communicated with the combustion chamber;

C. a plurality of spaced apart nozzles for combustion gas mounted in said burner zone, said nozzles having the axes of their outlets lying substantially in a common plane and their outlets so oriented that combusting gas issues from them in a sheet of flame across substantially the entire area of said zone whereby all portions of gas flowing from the preheater into the combustion chamber are exposed to combusting gas to be intensely heated thereby; and

D. the combustion chamber having a substantially J-shaped wall,

1. the straight long leg of said J-shaped wall being spaced from said burner zone and being in spaced substantially parallel relation to said other end wall of preheater, and
2. the rounded portion of said J-shaped wall being inwardly concave, curved on a substantially uniform radius through about **180°**, and joined to an edge of the burner zone that is remote from said straight long leg so that a substantial part of said rounded wall portion is in opposing, spaced relation to the burner zone to compel gas flowing out of the burner zone to undergo a reversal of direction in flowing through the combustion chamber and to reflect heat from the burner zone into substantial portions of the interior of the combustion chamber, thus subjecting substantially all portions of gas flowing through said chamber to reflected heat.

3,867,103

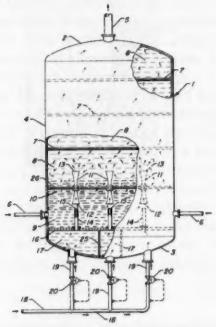
ALKYLATION APPARATUS

William G. Boney, Arlington Heights, and Paul J. Kuchar, Hinsdale, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 25, 1973, Ser. No. 373,544

Int. Cl. B01j *1/00;* **C07c** *3/12, 3/54*

U.S. Cl. 23—288 E **4 Claims**



1. An apparatus for contacting a hydrocarbon stream with a mineral acid-catalyst which comprises:

a. an enclosed receiving vessel having an upper and lower chamber;

b. hydrocarbon inlet means located in said lower chamber of said receiving vessel;

c. acid-catalyst inlet means located in said upper chamber of said receiving vessel;

d. an imperforate plate across the width of said vessel, said imperforate plate dividing said vessel into said upper and lower chambers, a plurality of standpipe means connected to said imperforate plate and positioned immediately above said hydrocarbon inlet means, said standpipe means being positioned vertically within the receiving vessel and each standpipe means having a hydrocarbon outlet;

e. a perforated plate above said imperforate plate and above the acid-catalyst inlets means and positioned across the width of said vessel, flow guide conduits located within the receiving vessel, said flow guide conduits being axially aligned above each of said standpipe means and affixed to said perforated plate, said flow guide conduits serving to promote eduction of acid-catalyst into the flow guide conduits by a high velocity hydrocarbon stream emitted from the openings in said standpipe means, and to contain and confine the hydrocarbon stream and prevent contact of a resulting acid-hydrocarbon emulsion with previously formed emulsion until the hydrocarbons and acid are

thoroughly mixed and the hydrocarbons at least partially reacted; and,

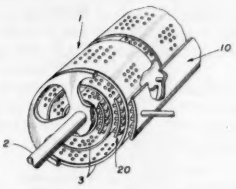
f. an emulsion outlet means located in said upper chamber of said receiving vessel.

3,867,104

POLYMERIZER REACTOR

Allen E. Leybourne, III, and Terry H. Baker, both of New Bern, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 12, 1973, Ser. No. 350,460
Int. Cl. B01f *15/00;* **B01j** *1/00;* **B65g** *33/00*
U.S. Cl. 23—285 **1 Claim**



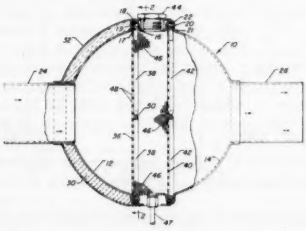
1. A polymerizer reactor comprising in combination: (A) a shaft rotating about its axis, (B) at least one rotor member comprising at least a segment each of a plurality of perforated hollow core cylinders being concentric with and surrounding a portion of said shaft, (C) means for coaxially supporting said perforated cylinders on said shaft, (D) a conveyor stator member comprising at least a portion of a cylindrical member having helical projections protruding radially and extending generally diagonally across at least one surface thereof, forming segmented helical channels, said helical channels being in working juxtaposition with at least one surface of at least one of said perforated hollow core cylinders, (E) a generally cylindrical vessel including the wall surrounding the outermost of said rotor and stator members, (F) means for introducing polymerizable material into said vessel, and (G) means for recovering polymerized material from said vessel.

3,867,105

DAMPED SUPPORT SCREEN FOR CATALYTIC CONVERTER

Melvin H. Wagner, Bartlett, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 386,804, Aug. 8, 1973, abandoned. This application Oct. 29, 1973, Ser. No. 410,670
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 F **14 Claims**



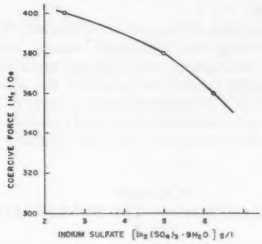
1. In a catalytic converter having a metal housing and a pair of catalyst retaining support screens retained against axial movement by radially extending portions of the inner wall of the housing, the improvement comprising rib support means including a plurality of rib portions extending outwardly from the central portion of at least one of said support screens and generally parallel to said support screen for strengthening said support screen, said rib support means being integrally attached to said at least one support screen only at said central portion thereof, the radially outermost portions of said rib support means being retained against axial movement by said radially extending portions of the inner wall of the housing, said radially outermost portions of said rib support means being free to move radially relative to said at least one screen as the temperature of said screen and rib support means changes.

3,867,106

MAGNETIC THIN FILM DATA STORAGE DEVICE AND METHOD OF MAKING

Hanumanthaya V. Venkatasetty, Burnsville, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 26, 1973, Ser. No. 428,462
Int. Cl. B23p *3/00;* **C23b** *5/32;* **G11c** *11/02*
U.S. Cl. 29—183.5 **9 Claims**



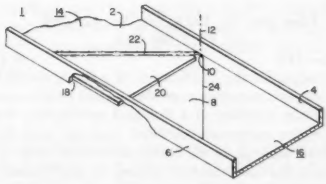
1. In a magnetic thin film data storage device having a non-magnetic metallic substrate and magnetic thin film for data storage overlaying said substrate, the improvement wherein said magnetic thin film is a ternery alloy containing from about 40 per cent to about 43 per cent nickel, from about 52 per cent to about 56 per cent cobalt and from about 2 per cent to about 6 per cent indium.

3,867,107

INTEGRAL CORNER FABRICATION

Olan L. Long, and Richard W. Sayward, both of Columbus, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1973, Ser. No. 336,398
Int. Cl. B21c *1/00*
U.S. Cl. 29—190 **1 Claim**



1. A corner formed by manipulating a single member having a cross-sectional shape including opposite flanges and an intervening web, said member having a cutout portion of its web with one boundary of the cutout portion located adjacent the flange forming the outer side of the corner after bending, and the opposite boundary of the cutout portion providing an extended length of separation between said web and the flange forming the inner side of the corner after bending, said member in the completed manipulated form of said corner having the portion of said inner flange free of said web displaced

toward the outer flange and crimped back upon itself and flattened against the inner face of said inner flange to secure said corner as formed; and,

said web having a section thereof contiguous with one side of said cutout portion and offset from the general plane of said web sufficiently to accommodate overlapping of said web contiguous to the opposite side of said cutout portion to form a double layer of material thereat when said corner is formed.

3,867,108

ACOUSTO-OPTIC DEVICES AND PROCESS FOR MAKING SAME

Gerard Argant Alphonse, Hightstown, and George Edward Bodeep, Wall Twp., both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 295,975, Oct. 10, 1973, Pat. No. 3,798,746. This application Dec. 3, 1973, Ser. No. 420,781

Int. Cl. B32b *15/04*; **H03h** *7/30*

U.S. Cl. 29—195 **5 Claims**

1. An acousto-optic device which comprises an acousto-optic medium having one roughened surface, a layer of a primer metal on said surface, which primer metal is the metal which is chemically bonded to oxygen in the acousto-optic medium, a layer of a conductive metal, a layer of indium, a second layer of said conductive metal and a transducer having a roughened surface in contact with said conductive metal.

3,867,109

PROCESS FOR IMPROVING THE BUNKERABILITY OF COAL

Edward J. Wasp, San Rafael, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 248,026, April 27, 1972, abandoned. This application Mar. 14, 1973, Ser. No. 341,132

Int. Cl. C10l *9/00*

U.S. Cl. 44—1 R **3 Claims**

1. A process for improving the bunkerability of coal which has been transported as a coal slurry, comprising the steps of heating the slurry to a temperature of about 190°F, mechanically dewatering the slurry to produce a heated cake, adiabatically flashing the heated cake to reduce the temperature thereof to about 100°F, contacting the cake with a purge gas and reducing the surface moisture of the cake to between about 5% and about 8%.

3,867,110

METHOD OF COAL PRETREATMENT

Frank C. Schora, Palatine, and Charles W. Matthews, Darien, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Dec. 17, 1973, Ser. No. 425,269

Int. Cl. C10j *3/06*

U.S. Cl. 48—210 **4 Claims**

1. In a process for the gasification of a finely divided solid carbonaceous feed material to produce a hot gaseous product by a gasification reaction in a fluidized gasification reaction bed wherein the carbonaceous feed material must be pretreated before passage to the fluidized reaction bed, to prevent caking of the feed material during the gasification reaction the improvement which comprises

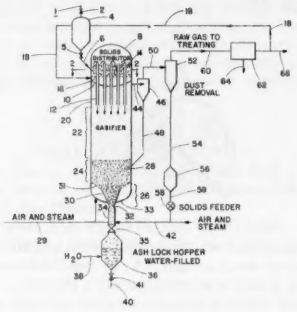
i. passing the finely divided feed material and a fluidizing gas into a solid distribution zone maintained at a temperature below about 500°F to produce a fluidized bed of feed material;

ii. said distribution zone positioned superjacent to the fluidized reaction bed said zone comprising a chamber having a solids inlet, a fluidizing gas inlet and a plurality of spaced apart distribution conduits passing through the bottom of said chamber and terminating within said chamber at a point above the solids inlet and fluidizing gas inlet;

iii. withdrawing a fluidized mixture of feed material and fluidizing gas from the fluized bed of feed material;

iv. passing the withdrawn fluidized mixture of feed material and fluidizing gas down through the distribution conduits;

v. discharging the fluidized mixture of feed material and fluidizing gas from each conduit a substantial distance above the fluidized gasification bed and into a pretreatment zone positioned above said gasification bed wherein the feed material from each conduit, as it is discharged, is permitted to settle downward together to the fluidized gasification bed;



vi. heating the settling feed material with the hot gaseous product emanating from the gasification reaction zone, in the pretreatment zone, to substantially instantaneously heat the feed material to a temperature sufficient to char the feed material; and

vii. maintaining the settling feed material within said pretreatment zone for a time sufficient to devolatilize the coal and destroy its caking properties before it reaches the fluidized gasification bed.

3,867,111

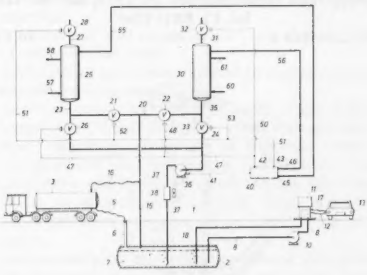
VAPOR RECOVERY SYSTEM

William T. Knowles, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 29, 1973, Ser. No. 392,578

Int. Cl. B01d *53/04*

U.S. Cl. 55—21 **5 Claims**



1. A system to recover gasoline from gasoline vapor-laden air that is vented while filling a first gasoline storage tank from the gasoline contained in a second gasoline storage tank, comprising:

A. a conduit for delivering liquid from the second storage tank to the first storage tank,

B. a conduit connecting the vapor space of the second storage tank to the vapor space of the first storage tank,

C. at least one vessel containing a bed of solid adsorbent

capable of selectively adsorbing gasoline from said vapor-laden air,

D. a valved vent to the atmosphere positioned to vent said vessel,

E. a valved inlet into said vessel on the other side of said bed from said vent, said inlet connected to said conduit connecting the vapor space of said second storage tank to the vapor space of said first storage tank,

F. a valved conduit from said vessel connecting the inlet side of said bed to the suction side of a vacuum pump,

G. a conduit for passing gasoline essentially at atmospheric pressure from the discharge side of said vacuum pump to a point below the surface of liquid in said first storage tank or said second storage tank,

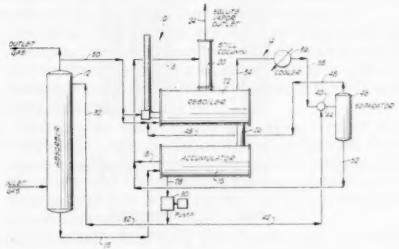
H. means are provided to simultaneously close the valve in said valved vent and the valve in said valved inlet, and to open the valve in said valved conduit, and to actuate said vacuum pump, and

I. means are provided to stop said vacuum pump (1) when a predetermined subatmospheric pressure of about 0.5 psia or less is reached, or (2) after a predetermined time period has elapsed from the time said pump started.

3,867,112
RECONCENTRATING SOLUTE-RICH LIQUID ABSORBENT

Joseph D. Honerkamp, and Paul M. Tournoux, both of Oklahoma City, Okla., assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Mar. 26, 1973, Ser. No. 344,840
Int. Cl. B01d *53/14*
U.S. Cl. 55—32 **18 Claims**



1. A method of reconcentrating a stream of solute-rich liquid absorbent which comprises:

a. heating the stream of rich liquid absorbent to vaporize a portion of the solute contained therein;

b. separating the vaporized solute from the liquid absorbent;

c. intimately contacting the resultant stream of partially reconcentrated liquid absorbent with a stream of stripping gas so that additional solute is vaporized and stripped therefrom to further reconcentrate the liquid absorbent;

d. separating the resulting mixture of stripping gas and vaporized solute from the reconcentrated liquid absorbent;

e. withdrawing the resulting stream of reconcentrated liquid absorbent;

f. intimately contacting said mixture of stripping gas and solute with a stream of lean liquid absorbent so that at least a portion of the solute is removed therefrom;

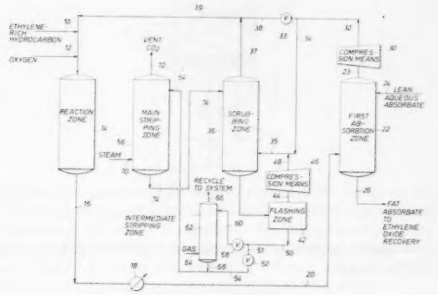
g. separating the resulting rich liquid absorbent from said stream of stripping gas and solute; and

h. recycling said stream of stripping gas and solute into intimate contact with the partially reconcentrated liquid absorbent of step (c).

3,867,113
ETHYLENE OXIDE PROCESS

E. Gordon Foster; Paul F. Russell, and Robert G. Vanderwater, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed July 16, 1973, Ser. No. 379,276
Int. Cl. B01d *53/14*
U.S. Cl. 55—44 **4 Claims**



1. A process for separating an essentially hydrocarbon-free carbon dioxide stream from a recycle stream containing C_{1-2} hydrocarbons in the partial oxidation of ethylene to ethylene oxide, wherein the hydrocarbons entrained and/or dissolved with the carbon dioxide stream are recovered which process comprises

a. contacting at least a portion of the total recycle hydrocarbon stream with a carbon dioxide absorbing aqueous liquid in a scrubbing zone, thereby producing a hydrocarbon-rich overhead and a carbon dioxide-fat absorbate containing some hydrocarbon,

b. flashing said fat absorbate in a flashing zone to produce a hydrocarbon-containing vapor stream and a hydrocarbon-lean, carbon dioxide-fat absorbate,

c. contacting at least a portion of the hydrocarbon-lean, carbon dioxide-fat absorbate in an intermediate stripping zone with steam or an inert gas to produce a hydrocarbon-containing overhead vapor stream and a substantially hydrocarbon-free, carbon dioxide-fat absorbate, and

d. combining any hydrocarbon-lean, carbon dioxide fat absorbate and the substantially hydrocarbon-free absorbate streams in a stripping zone to produce a carbon dioxide overhead steam substantially free of hydrocarbons.

3,867,114
DEVICES WHEREBY THE LOCAL FLUID RATES IN A FLUIDISED BED ARE MADE TO FLUCTUATE

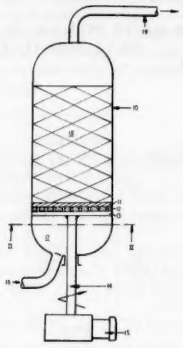
Ian Dracup Doig, Roseville Chase, New South Wales, Australia, assignor to Unisearch Limited, Kensington, Wales

Filed Apr. 23, 1973, Ser. No. 353,888
Claims priority, application Australia, Apr. 27, 1972, 8768/72
Int. Cl. B01d *53/06*
U.S. Cl. 55—77 **4 Claims**

1. A method of operating a fluidized bed comprising:

varying the effective resistance of the grid of the bed to the flow of fluid in a programmed manner, by selectively opening a portion of some holes while simultaneously closing an equivalent portion of other holes elsewhere in

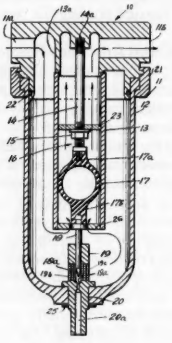
the grid, and continuously changing the holes being opened and closed, whereby gross fluid flow is maintained substantially invariant and preferred channels are avoided.



3,867,115
AIR WATER SEPARATOR

Leo A. Heintzelman, 4990 Burlingame S.W., Wyoming, Mich. 49509

Filed Jan. 14, 1974, Ser. No. 432,887
Int. Cl. B01d *45/06*
U.S. Cl. 55—218 **15 Claims**



1. A gas-liquid separator for separating liquids and other contaminants from a pressurized gas comprising:

a housing having an open interior;

gas inlet means in said housing for receiving gas containing liquid and other contaminants;

drain means in a bottom portion of said housing for draining the liquid and other contaminants therefrom;

gas outlet means in said housing for exhausting gas from the separator;

a hollow conduit having an inlet in communication with the housing inlet and an outlet in communication with the housing outlet such that the gas must flow through the conduit in order to leave the separator by the housing outlet;

contaminant removal means fitted in the hollow conduit and adapted to constrict the flow of gas to the space between said means and the interior surface of the hollow conduit in passing through the conduit, said contaminant removal means comprising resilient wiper means at the outer periphery thereof adapted to resiliently engage the interior surface of the hollow conduit at least when gas is flowing through the separator, said wiper means being resiliently urged outwardly against the interior surface of the conduit with sufficient force to impair the passage of estrained liquids and particulate contaminates in said gas past the wiper means, while permitting pressurized gas to pass through the conduit between the wiper means and the interior of the hollow conduit;

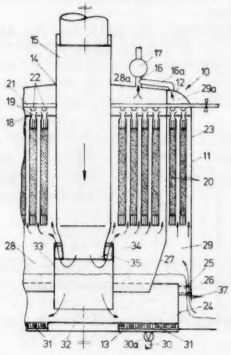
valve means in the separator for opening and closing the drain means; and

valve control means in the separator adapted to open the valve means when gas is passing through the separator and close the valve means when gas is not passing through the separator.

3,867,116
SEPARATOR

Horst Muller, Forch, Switzerland, assignor to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Dec. 6, 1972, Ser. No. 312,697
Claims priority, application Switzerland, Dec. 10, 1971, 18027/71
Int. Cl. B01d *50/00*
U.S. Cl. 55—319 **12 Claims**



1. An apparatus for separating fine-grained material out of an air stream in which the material is suspended, comprising means defining a housing structure including a first enclosure wall having a floor, and

fluidizing means located above the floor,

a conveyor pipe having an open outlet end and extending therewith into said housing for introducing said stream downwardly into said housing,

an expansion pipe open at both ends surrounding the open outlet end of the conveyor pipe and spaced above said fluidizing means,

an air outlet defined in the upper part of said housing to discharge the air from the stream,

suction means connected to said air outlet operable to establish and maintain a reduced pressure within the housing,

filter means disposed upstream of said air outlet operable for restraining the exiting of the fine-grained material through said air outlet,

at least one discharge opening defined in said housing above the fluidizing means and operable for discharging said fine-grained material,

a second wall within the housing spaced from the first wall and extending downwardly from the upper portion of the

housing at least to a level below the discharge opening, and

inlet means associated with the floor operable for admitting fluidizing air to said fluidizing means thereby to convey the fine-grained material to the discharge opening.

3,867,117

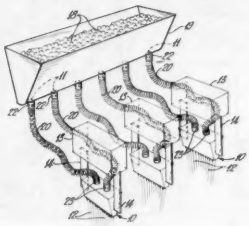
METHOD AND APPARATUS FOR FORMING GLASS FIBERS AND MARBLE DELIVERY MEANS THEREFOR

James A. Bebart, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 274,781, July 24, 1972, abandoned. This application Jan. 4, 1974, Ser. No. 430,845

Int. Cl. C03b *37/02*

U.S. Cl. 65—2 **2 Claims**



2. A method of preventing marble jamming in a flexible convoluted curvilinear configured spring conduit conveying glass marbles from an elevated supply hopper to a lower elevation glass melting chamber comprising the steps of:

a. providing a continuous flexible convoluted curvelinear configured spring conduit form said elevated supply hopper to the glass melting chamber having a substantial portion thereof extending down steeply sloped vertical drop sections,

b. feeding glass marbles into said spring conduit at the hopper end totally filling said spring conduit and thereby causing said steeply sloped sections to be spring loaded to the extent that the increased spacing between convolutions is small with respect to the diameter of the marbles contained therein,

c. intermittently dispensing glass marbles into the melting chamber thereby inducing random vibrational modes throughout the spring conduit agitating the marbles therein preventing marble jams,

d. resupplying glass marbles at the hopper end of said conduit thereby maintaining a full head of marbles throughout the total length of the spring conduit.

3,867,118

APPARATUS FOR PRODUCTION OF GLASS FIBERS

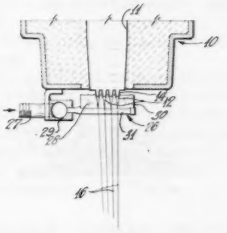
Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 14,708, Feb. 9, 1970, abandoned, which is a continuation of Ser. No. 636,112, May 4, 1967, abandoned. This application Mar. 19, 1971, Ser. No. 126,306

Int. Cl. C03b *37/02*

U.S. Cl. 65—12 **6 Claims**

2. Apparatus for producing filaments of heat-softenable material comprising a feeder for feeding such material in molten form having orifices from which streams of such material flow, means for continuously attenuating the streams to filaments in an attenuating zone immediately adjacent said feeder, and environmental control means in said attenuating zone disposed between said streams subdividing the total number of streams emitted from said orifices into smaller groups so that each stream has a portion of said control means in adjacent heat absorbing and liquid vaporizing relationship therewith, said portion adjacent each stream including a wick element of deformable fibrous material to prevent feeder damage and means for continuously supplying a liquid to the external surface in response to heat absorbed from said adjacent stream, said liquid supplying means supplying liquid to



said surface at a rate sufficient to replenish the liquid on said surface as the liquid vaporizes to maintain the temperature of said surface of said wick element at the vaporization temperature of said liquid to maintain a uniform surface temperature adjacent said stream and including a liquid carrying conduit for each wick, each wick extending from its conduit.

3,867,119

APPARATUS FOR MANUFACTURING GLASS FIBERS

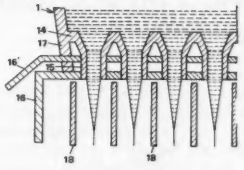
Kesaharu Kasuga, Tokyo; Takeo Abe, and Tsunehiro Haga, both of Koriyama, all of Japan, assignors to Paramount Glass Mfg. Co. Ltd., Koriyama City, Fukushima-ken, Japan

Continuation of Ser. No. 163,578, July 19, 1971, abandoned. This application Sept. 25, 1973, Ser. No. 400,696

Claims priority, application Japan, July 20, 1970, 45-63420

Int. Cl. C03b *37/02*

U.S. Cl. 65—12 **5 Claims**



1. Apparatus for manufacturing glass filaments comprising means for holding a body of molten glass to be formed into said filaments, said means having an inner rectangularly-shaped bushing plate for supporting said body, a plurality of tubes extending below said inner plate each communicating with said holding means through an orifice in said inner plate whereby molten glass may flow out of said holding means, an outer rectangularly-shaped bushing plate spaced from said innder bushing plate spaced from said inner bushing plate, the space between said outer bushing plate and said inner bushing plate being filled with air and enclosed, said outer bushing plate being provided with a plurality of equally spaced apertures corresponding in number and arrangement to the said orifices also equally spaced, to receive the lower ends of said tubes, said lower ends being disposed without extending downward below said outer bushing plate, said outer plate being made of electrically-conductive material providing electrical resistive heating zones therein, and means for supplying an electric current to said outer plate and a third plate located between and parallel to the inner and outer plates in heat conductive relation to the tubes extending therethrough.

3,867,120

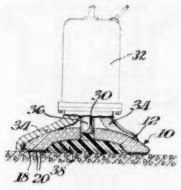
ROADWAY MARKER AND METHOD OF MAKING IT

Howard A. Schaefer, c/o Anchor Hocking Corporation, Lancaster, Ohio 43130

Continuation-in-part of Ser. No. 296,947, Oct. 12, 1972,. This application Nov. 9, 1972, Ser. No. 305,167

Int. Cl. C03b *27/00*

U.S. Cl. 65—62 **13 Claims**



1. A roadway marker comprising a body member, said body member being made of tempered glass capable of disintegrating into small particles with minimal sharp fracture edges upon failure and breakage of said body member, said body member having an impact strength of at least 10,000 psi, said body member being concave with an internal cavity exposed at its lower surface, said internal cavity being filled with a sealing compound, said body member having securing means on its bottom surface including the exposed surface of said compound for securement of said marker to a roadway, and the external surfaces of said body member above said securing means being of smooth contour.

12. The method of claim **11** including applying a ceramic coloring to the interior of the body prior to the heating step.

3,867,121

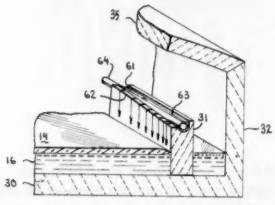
METHOD AND APPARATUS FOR THE MANUFACTURE OF THIN GLASS ON MOLTEN METAL

Thomas R. Trevorrow, Ford City, and Kenneth R. Graff, Cabot, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 6, 1973, Ser. No. 338,474

Int. Cl. C03b *18/02*

U.S. Cl. 65—65 A **4 Claims**



1. In the method of manufacturing glass comprising the steps of delivering a stream of molten glass onto a pool of molten metal, conveying the glass along the surface of the pool of molten metal cooling the glass to form a dimensionally stable, continuous sheet of glass and withdrawing the continuous sheet of glass from the pool of molten metal, the improvement comprising:

a. flowing the molten glass onto the pool of molten metal between a spaced pair of restraining members comprising material that is at least partially wettable by molten glass;

b. providing a lubricant between the marginal edges of the glass and the restraining members with more lubricant being provided near the downstream ends of the restraining members, farthest from the location of glass delivery onto the pool of molten metal, than near their upstream ends, closest the location of glass delivery onto the pool of molten metal; and

c. cooling the glass between the pair of restraining members while applying a sufficient longitudinal force to it to convey it in the direction of glass withdrawal from the pool of molten metal.

3,867,122

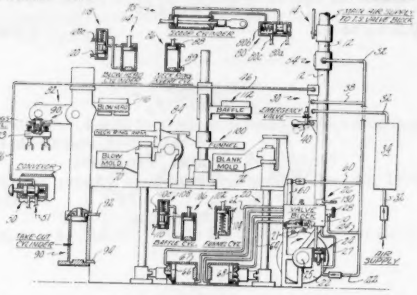
SHUT OFF SYSTEM FOR GLASSWARE FORMING MACHINE

Joseph P. Miller, Tariffville, Conn., assignor to Emhart Corporation, Bloomfield, Conn.

Filed Feb. 20, 1973, Ser. No. 333,655

Int. Cl. C03b *9/40*

U.S. Cl. 65—159 **9 Claims**



1. In a pneumatically operated mechanically controlled glassware forming machine wherein a rotating drum is associated with a system of levers and latches to actuate tappet valves in a valve block to selectively direct air to the various pneumatically operated components of the machine; the improvement comprising:

a. main air supply means including a supply manifold in said valve block,

b. a shut off valve in said air supply means, said shut off valve being normally open and pneumatically closed,

c. a pneumatically controlled clutch for said rotating drum, said clutch being normally engaged to rotate the drum and pneumatically disengage to stop its rotation,

d. a secondary air pressure manifold for said pneumatically closable shut off valve and said pneumatically disengageable clutch,

e. a normally closed manually openable emergency valve for selectively connecting said shut off valve and said clutch to said secondary manifold

f. a manually operable member associated with the pneumatic clutch for said rotating drum to permit the drum to be manually disengaged without use of said emergency valve, spring biasing means for urging said member toward its disengaged position, a spring loaded plunger for engaging a detent in said member to hold the member in its engaged position, pilot valve means for said plunger, and a branch line of said secondary pressure manifold communicating with said pilot valve to automatically release said plunger from its detent and to let said member move toward its disengaged position when said emergency valve is opened.

3,867,123

MOLD OPERATING MECHANISM

Joseph R. Hamilton, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.

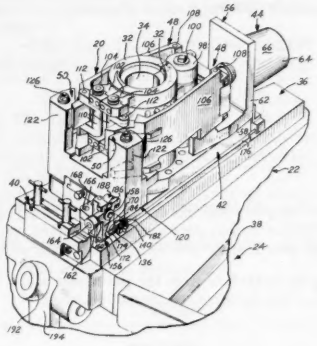
Filed Aug. 13, 1973, Ser. No. 387,694

Int. Cl. C03b *9/00*

U.S. Cl. 65—359 **12 Claims**

1. A mold operating mechanism for opening and closing a mold for forming articles therein under relatively high molding pressures between a pair of molds and a ram, said mechanism comprising, in combination, a support member having first and second rigid portions, a pair of mating mold mem-

bers, movably mounted on said support member, fluid pressure drive means operated by relatively low pressures for moving said mold members between a closed, article molding position, and an open position for releasing the molded article from the mold, first and second link means for operatively interconnecting each of said mold members with said drive means, and cooperating means on each of said link means and on each rigid portion for locking each of said mold members



in the closed position for resisting relatively large external forces from said molding pressures normally tending to open said mold, said drive means and said cooperating means holding said mold members in the closed molding position, said cooperating means also being constructed and arranged to facilitate release of said mold members from the locked and closed position, in response to relatively low opening pressures from said drive means.

3,867,124

WATER SOLUBLE FERTILIZER

John W. Church, deceased, late of 292 Fern Palm Rd., Boca Raton, Fla. 33432 (First Bank and Trust Company of Boco Raton and Dorothy M. Church, co-executors)

Filed Oct. 26, 1970, Ser. No. 84,148
Int. Cl. C05c *9/00*
U.S. Cl. 71—1 **7 Claims**

1. A granular, water soluble fertilizer comprising ammonium nitrate particles with a water soluble coating thereon which comprises the reaction product of urea and one or more of the following water soluble mineral element salts: ferrous sulfate ($FeSO_4 \cdot 7H_2O$), magnesium sulfate ($MgSO_4 \cdot 7H_2O$), and copper sulfate ($CuSO_4 \cdot 5H_2O$).

3,867,125

COMPOSITION FOR AND METHOD OF DEFOLIATION

John William Jenney, Montebello; Dennis Ambrose Donaghu, Pleasant Hill, both of Calif.; Louis Peter Cartsunis, Oklahoma City, and Donald Sylvester Batchelor, Norman, both of Okla., assignors to Ken-Mcgee Chemical Corp., Okalhoma City, Okla.

Filed Feb. 8, 1973, Ser. No. 330,691
Int. Cl. A01n *11/00*
U.S. Cl. 71—69 **10 Claims**

1. A defoliant comprising an aqueous solution containing an alkali metal chlorate in an amount of from about 1 to about 30 percent by weight, an alkali metal carbonate and urea, said carbonate and urea being present in an amount sufficient to provide a ratio of carbonate and urea to chlorate within the range of from about 0.2:1 to 1.2:1 and a ratio of carbonate to urea within the range of from about 1:4 to 4:1.

3,867,126

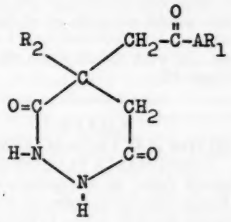
COLD AND FROST TOLERANCE IN LIVING PLANTS WITH 3,6-DIOXO-4-PYRIDAZINE ACETIC ACID DERIVATIVES

Robert Howard Kupelian, Yardley, Pa., assignor to American Cyanamid Company, Stamford, Conn.

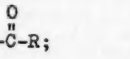
Filed Sept. 15, 1972, Ser. No. 289,525
Int. Cl. A01n *9/22*
U.S. Cl. 71—92 **9 Claims**

1. A method for improving cold and frost tolerance in living plants, comprising:

applying to the surfaces of the plants before the plants are subjected to cold temperatures and frost and prior to and during the budding, flowering and fruiting stages of the plants, an effective amount for protecting the plants against injury due to cold and frost of a compound, a tautomer of a compound or a mixture of compounds having the structure:



wherein A is oxygen of -NH-; R_1 is hydrogen or alkyl C_1–C_6; R_2 is hydrogen, hydroxyl or



R is alkyl C_1–C_6, alkenyl C_1–C_6 or phenylene, and R_1 and R_2 taken together form a methylenoxy bridge.

3,867,127

AMINE FRUIT ABSCISSION AGENTS

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 11, 1973, Ser. No. 350,273
Claims priority, application Switzerland, Apr. 19, 1972, 5774/72
Int. Cl. A01r *9/20*
U.S. Cl. 71—121 **2 Claims**

1. A method for the promotion of citrus fruit abscission which comprises applying to the citrus fruit-bearing plants an effective amount of nonylamine.

2. A method for the promotion of citrus fruit abscission which comprises applying to the citrus fruit-bearing plants an effective amount of decylamine.

3,867,128

PROCESS FOR PRODUCING HIGH SPECIFIC GRAVITY MATERIAL FROM LOW GRADE IRON ORE

James Thomas Hancock, Jr., 11602 Applewood, Houston, Tex. 77024

Filed Dec. 18, 1972, Ser. No. 316,232
Int. Cl. C22b *1/00*
U.S. Cl. 75—1 **12 Claims**

1. A process for preparing a non-magnetic iron oxide-containing material having a specific gravity of at least 4.2 from an iron ore having a specific gravity of about 3.6 to about 3.9 which comprises the steps of:

a. calcining said iron ore under oxidizing conditions at a residence time sufficient to maintain the ore at between about 1700°F. to less than about 2050°F. for at least 20 minutes;
b. quenching the calcined ore; and
c. recovering the quenched iron oxide-containing materials; wherein,
the recovered material is non-magnetic and has a specific gravity of at least 4.2.

3,867,129

ANODICALLY OXIDIZABLE METAL POWDER

Gerard S. Ronneau, Edegen; Pierre D. Debacker, Hoboken, and Hugo L. Carpentier, Aartselaar, all of Belgium, assignors to Metallurgie Hoboken-Overpelt

Filed Feb. 5, 1974, Ser. No. 439,805
Int. Cl. B22f 9/00; C22c 27/00
U.S. Cl. 75—0.5 BB **6 Claims**

1. A valve-metal base powder for use in electronics, the grains of which powder are made up of the said valve-metal containing between about 0.06 and about 2 percent by weight of at least one additive metal chosen in the group consisting of Mo, V, W, and Hf.

3,867,130

METHOD FOR ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Evgenievich Paton, ul. Kotsjubinskogo, II/13, kv. 21; Vladimir Konstantinovich Lebedev, ul. Engelsa, 25, kv. 12; Boris Izrailevich Medovar, bulvar L. Ukrainki, 2, kv. 8; Jury Vadimovich Latash, Vozdukheflotsky prospekt, 61, kv. 14; Nikolai Vasilievich Podola, Pushkinskaya ul., 8, kv. 12; Oleg Petrovich Bondarenko, Kreschatik, 15, kv. 34, all of Kiev; Semen Abramovich Leibenzon, prosp. Lenina, 185, kv. 36, Zaporozhie; Gary Petrovich Kaganovsky, Patrioticheskaya ul. 48, kv. 71, Zaporozhie; Vadim Filimonovich Smolyakov, pr. Lenina, 155 kv. 60, Zaporozhie; Konstantin Sergeevich Eltsov, ul. 40 letia Sovetskoi Ukrainy, 6, kv. 1, Zaporozhie; Georgy Kharitonovich Gabuev, Prospekt Lenina, 228, kv. 17, Zaporozhie, and Dmitry Fedorovich Gladky, Prospekt Metallurgov, 3, kv. 33, Zaporozhie, all of U.S.S.R.

Division of Ser. No. 56,141, July 6, 1970, Pat. No. 3,693,700, which is a continuation of Ser. No. 641,605, May 26, 1967, abandoned. This application Feb. 17, 1972, Ser. No. 227,638
Int. Cl. C22d 7/00; H05b 7/18
U.S. Cl. 75—10 R **8 Claims**

1. A method of electroslag remelting of a consumable electrode comprising preparing a bath of molten slag in a mold, immersing said consumable electrode in said bath of molten slag, passing alternating current through said electrode to melt and form a liquid metal bath in said mold, and modulating the amplitude of said alternating current at a predetermined frequency substantially below the frequency of said alternating current.

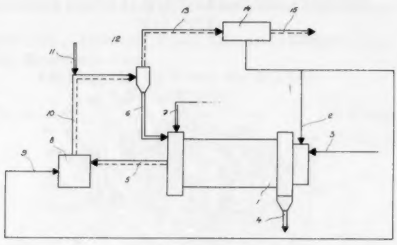
3,867,131

METALLURGICAL PRODUCTION METHOD

Folk Engstrom, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed May 31, 1973, Ser. No. 365,522
Claims priority, application Finland, June 12, 1972, 1668/72
Int. Cl. C21b 3/04, 11/06
U.S. Cl. 75—25 **5 Claims**

1. A process for pre-reducing an ore concentrate in a metallurgical process in a rotating cylinder furnace in which the ore and the reducing gas are introduced in opposite directions, the ore is preheated and exhaust gases containing unburnt material are removed, which comprises
a. burning in an after-combustion chamber the still unburnt components in the exhaust gases emerging from the cylinder furnace to generate combustion gases,
b. adding a ground concentrate to the combustion gases from said after-combustion chamber,
c. feeding said ground concentrate and combustion gases into a pre-heater
d. separating the pre-heated concentrate and the dust contained in said exhaust gases from the combustion gases,



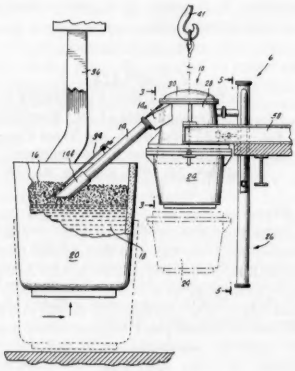
e. feeding said separated components into the cylinder furnace,
f. feeding the pure combustion gases into an air pre-heater, and
g. using the heated air from the pre-heater in the cylinder furnace and the after-combustion chamber.

3,867,132

METHOD OF DESLAGGING MOLTEN METAL

Thomas E. Perry, Chagrin Falls, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 841,026, July 11, 1969, Pat. No. 3,632,096. This application June 25, 1971, Ser. No. 156,961
Int. Cl. C21c 7/10; C21b 3/04, 3/04
U.S. Cl. 75—49 **1 Claim**



1. A method of deslagging molten metal, comprising;
a. locating a ladle means containing molten metal and a layer of slag beneath uptake tube means coupled to a chamber means including a vacuum source such that said uptake tube means is disposed substantially entirely about the upper surface of said slag and molten metal and is substantially immersed within said slag and molten metal; and
b. applying a vacuum to the slag and the molten metal contained in said ladle means through said uptake tube means to cause substantially all of said slag and a portion of said molten metal to rise in said uptake tube means to transfer said slag to said chamber means, the pressure difference between said chamber means and the surface of said slag outside said uptake tube means being suffi-

cient to support a column filling said uptake tube means of slag or slag and molten metal but not molten metal alone.

3,867,133

REFINING PROCESS FOR REMOVING MO FROM HIGH-NI AND/OR HIGH-CO, MO-CONTAINING ALLOY STEELS

Kazutaka Naguro, and Takao Seya, both of Tokyo, Japan, assignors to Kawaguchi Seiko Kabushiki Kaisha, Kawaguchi, Japan

Filed Sept. 17, 1973, Ser. No. 398,157

Claims priority, application Japan, Mar. 23, 1973, 48-32736

Int. Cl. C21c *7/04;* **C22c** *33/00*

U.S. Cl. 75—53 **5 Claims**

1. A refining process for removing Mo from a Mo-containing alloy steel having a high content of at least one of Ni and Co, which comprises:

subjecting said Mo-containing alloy steel to oxidation melting refining at a temperature of from about 1500°C. to about 1650°C. to form a peroxidized molten steel containing Mo oxides and having the following approximate elemental analysis in percent

	by weight [,]
Cr	<1
C	<0.1
P	<0.1
Mn	<0.1
Si	<0.1
O	>0.02,

contacting said peroxidized molten steel at a temperature of from about 1400°C. to about 1550°C. with a basic double oxide comprising (i) at least one basic oxide selected from the group consisting of an alkali metal oxide and an alkaline earth metal oxide and (ii) at least one acid oxide, and with at least one oxidizer selected from the group consisting of a solid oxidizer, oxygen gas, an oxygen-enriched gas and a mixture thereof, to form a double salt of said double oxide and said Mo oxides, and

discharging a slag containing said double salt.

3,867,134

METHOD FOR PRODUCING STAINLESS STEEL IN A BASIC OXYGEN FURNACE

Richard B. Shaw, Natrona Heights, and Richard F. Carlson, Tarentum, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 267,340, June 29, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,570

Int. Cl. C21c *5/32*

U.S. Cl. 75—60 **11 Claims**

1. In the manufacture of stainless steel having a carbon content of under 0.03 percent, the steps of:

charging into a vessel molten ferrous metal and cold chromium-containing materials with the cold material constituting at least 10 percent by weight of the total charge and the mixture of molten and cold materials containing at least 3.5 percent by weight of carbon,

top blowing essentially pure oxygen onto the surface of the molten ferrous metal through a nozzle positioned above said surface until at least 50 percent of the total oxygen required for refining has been blown onto the surface of the bath, and

thereafter blowing a mixture of oxygen and a non-oxidizing gas onto the surface of the molten metal through said nozzle until the carbon content thereof has been reduced to below 0.03 percent.

3,867,135

METALLURGICAL PROCESS

Hans Klas Olof Johnsson, and Lars Anders Eriksson, both of Hagfors, Sweden, assignors to Uddeholms Aktiebolag, Uddeholm, Sweden

Filed Oct. 5, 1972, Ser. No. 295,355

Claims priority, application Great Britain, Oct. 6, 1971, 46507/71; Feb. 28, 1972, 9162/72; Sweden, June 9, 1972, 7583/72

Int. Cl. C21c *5/34*

U.S. Cl. 75—60 **14 Claims**

1. A method of reducing the carbon content of a carbon-containing alloy, said alloy containing at least 10 percent by weight of chromium and, as the major component thereof, at least one metal selected from the group consisting of iron, cobalt and nickel, said method comprising:

a. first melting the alloy and bringing the molten alloy substantially up to the decarburization temperature essentially by oxidising substantially completely any silicon present in the alloy and also, if necessary, at least part of any other readily oxidisable component present in the alloy

b. thereafter, decarburizing the alloy at a decarburization temperature of about 1,550° to about 1,800°C by introducing a mixture consisting essentially of oxygen and at least one hydrogen containing compound selected from the group consisting of steam and ammonia into the molten alloy at least about 20 cms. below the surface thereof, said oxygen oxidizing carbon in the alloy to carbon monoxide, the volume ratio of the introduced oxygen to hydrogen-containing compound in said mixture during at least part of the main decarburization period being below 3:1, said hydrogen containing compound liberating elementary hydrogen in the molten alloy, the amount of hydrogen and carbon monoxide in the molten alloy being such that the partial pressure of carbon monoxide in the molten alloy is below 0.5 atmospheres and lower than that partial pressure which corresponds to the equilibrium pressure for the carbon/chromium oxidation c. maintaining the molten alloy at a decarburization temperature of at least about 1,550°C essentially by oxidizing chromium in the alloy, wherein the decarburization temperature is at least partly controlled by varying the volume ratio of introduced oxygen to hydrogen-containing compound, said ratio being decreased during the course of the decarburization to below 1:1, using amounts and concentrations such that the decarburization temperature is essentially maintained at no greater than about 1,800°C and

d. thereafter removing at least part of the hydrogen remaining in the molten alloy.

3,867,136

DECARBURISATION OF CHROMIUM CONTAINING IRON, COBALT OR NICKEL BASED ALLOYS

Lars Anders Eriksson, and Karl-Erik Oberg, both of Hagfors, Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Oct. 5, 1973, Ser. No. 403,854

Claims priority, application Sweden, Oct. 6, 1972, 12907/72

Int. Cl. C21c *5/32*

U.S. Cl. 75—60 **11 Claims**

1. A method of reducing the carbon content of an iron, cobalt or nickel based alloy containing carbon and at least 10 percent by weight chromium by introducing into the molten alloy oxygen and at least one hydrogen yielding gas selected from the group consisting of steam and ammonia wherein a first mixture consisting essentially of a minor proportion by volume of oxygen and a major proportion by volume of the hydrogen yielding gas is introduced into the molten alloy through an inner section of a tuyere comprising at least two coaxial pipes and having at least one inner section and an outermost section, the amount of hydrogen yielding gas being

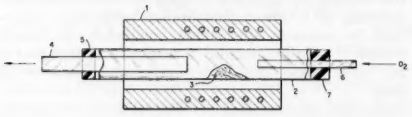
sufficient to bring about an endothermal reaction when the hydrogen yielding gas meets the molten alloy, and introducing through the outermost section of the tuyere a second mixture which is a gas which undergoes an exothermal reaction when it meets the molten alloy and which second mixture consists essentially of oxygen and a cooling gas.

3,867,137

PURIFICATION OF IRIDIUM

Henry Inouye, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed June 22, 1973, Ser. No. 372,886
Int. Cl. C22b *11/02*
U.S. Cl. 75—83 **8 Claims**



1. A method for purifying iridium comprising the steps of oxidizing impure iridium to form volatile IrO_3, decomposing the IrO_3 to condense IrO_2 as a solid at a point away from said oxidizing step, and reducing the IrO_2 to iridium metal.

3,867,138

SELECTIVELY BLEACHING DYES AND PIGMENTS IN DEVELOPED ELECTROPHOTOGRAPHIC LAYERS

Masaaki Takimoto, and Satoru Honjo, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 197,493, Nov. 10, 1971,. This application Sept. 6, 1973, Ser. No. 394,808
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 R **21 Claims**

1. A process for toning an electrophotographic layer comprising the steps of

forming a developed image on an electrographic layer comprising a photoconductive powdered material, a resinous binder, and at least two coloring materials selected from the group consisting of sensitizing dyes and pigments and mixtures thereof at least one of said coloring materials being a sensitizing dye or sensitizing pigment, said two coloring materials having different fading rates and being further selected from at least two of the following groups: group (a) comprising coloring materials having an absorption rate variation greater than 15%; group (b) comprising coloring materials having an absorption rate variation less than 3%; and group (c) comprising coloring materials having an absorption rate variation from 3 to 15%; and

selectively bleaching at least one of said coloring materials so that at least one of said coloring materials remains in said electrophotographic layer to thereby tone said layer.

3,867,139

PROCESS OF MAKING A PHOTOCONDUCTIVE MATERIAL OF CADMIUM SULFIDE AND CADMIUM CARBONATE

Yoshihiko Yamada, and Katsuo Makino, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1972, Ser. No. 245,811
Claims priority, application Japan, Apr. 20, 1971, 46-24968
Int. Cl. G03g *5/04*
U.S. Cl. 96—1 PC **20 Claims**

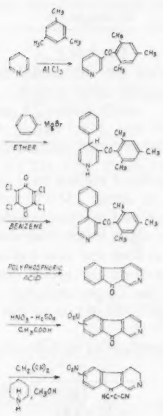
1. A process for making a photoconductive material which comprises preparing a photoconductive material of fine powder particles principally of cadmium sulfide and cadmium carbonate in physico-chemical combination, washing said photoconductive material with water to remove water soluble matter, and subsequently adsorbing a silicon compound on said washed photoconductive material so that said photoconductive material contains about 0.1 to 5% weight of said silicon compound whereby a clear image of high density and little background fog may be obtained on said photoconductive material even in an atmosphere of high temperature and humidity.

3,867,140

ORGANIC PHOTOCONDUCTOR-(MONONITRO-2-AZA-FLUORENYLIDENE)MALONONITRILE CHARGE TRANSFER COMPLEX

Mitsuru Hashimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Jan. 24, 1973, Ser. No. 326,563
Claims priority, application Japan, Jan. 24, 1972, 47-9293
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.5 **1 Claim**



1. A photosensitive material for use in electrophotography which is a charge transfer complex comprising 100 parts by weight of an organic photoconductor and 1 to 150 parts by weight of (mononitro-2-aza-9-fluorenylidene) malononitrile.

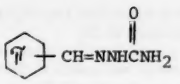
3,867,141

PHOTOELECTRIC AND ELECTROPHOTOGRAPHIC PIGMENTS COMPRISING DERIVATIVES OF CONDENSED POLYCYCLIC AROMATIC HYDROCARBON ALDEHYDES

John Alf Bergfjord, Macedon; Steven James Grammatica, Webster, and Richard William Radler, Marion, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1973, Ser. No. 337,786
Int. Cl. G03g *5/02*
U.S. Cl. 96—1.5 **10 Claims**

1. A photoelectrophoretic imaging suspension comprising a substantially insulating liquid carrier medium having dispersed therein an electrically photosensitive pigment composition comprising a pigment having the formula:



wherein

represents a condensed polycyclic aromatic group having from about 14 to about 20 carbon atoms.

3,867,142

PHOTOSENSITIVE MATERIALS FOR PRODUCING PRINTING PLATES

Willy Krause, Am Rottland, Germany, assignor to Krause Offset System KG, Bielefeld, Germany

Filed Apr. 16, 1973, Ser. No. 351,506
Int. Cl. G03c *5/08*
U.S. Cl. 96—35.1 **6 Claims**

1. A supported photosensitive film which consists essentially of a polymer of an aldol-condensation product of terephthalaldehyde and diacetone alcohol having a molecular weight between 5000 and 15,000 and a sensitizer therefor.

6. A process for the production of a printable image on a printing plate coated with a film of the photosensitive film-forming substance defined in claim **2**, which comprises exposing to light the film on the plate to produce a latent image therein, and thereafter developing the exposed film by treating it with a liquid containing N,N-dimethylformamide or other dialkyl-substituted acid amide or a low-molecular-weight aliphatic acid and subsequently treating the film with a natural or synthetic colloid, or phosphoric acid or a phosphate, or both, to increase its water-absorbability.

3,867,143

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Hiroshi Tanaka, and Takashi Saito, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 256,198, May 23, 1972, abandoned, which is a continuation of Ser. No. 1,867, Jan. 9, 1970, abandoned. This application Nov. 12, 1973, Ser. No. 414,820
Claims priority, application Japan, Jan. 17, 1969, 44-3262
Int. Cl. G03g *5/04*
U.S. Cl. 96—1.5 **3 Claims**

1. An electrophotographic photosensitive member comprising a support layer, a photoconductive layer overlying the support layer and an insulating overlying the photoconductive layer and at least one of the layers adjacent to the photoconductive layer being transparent to a radiation to which the photoconductive layer is sensitive, characterized in that the photoconductive layer comprises an amorphous glassy alloy containing about 72 – 85% by weight of selenium, about 10 – 20% by weight of antimony and about 5% by weight of germanium and has a resistivity at dark place of not less than 1×10^{11} ohm-cm.

3,867,144

SPECTRALLY SENSITIZED ELECTROPHOTOGRAPHIC MATERIALS

Wendell Maurice Lee, Lawrence Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,573
Int. Cl. G03g *5/06, 5/08*
U.S. Cl. 96—1.7 **6 Claims**

1. Spectrally sensitized light-sensitive material comprising a photoconductor and at least one azomethine dye having an o,o'dihydroxy or an o-hydroxy-o'-mercapto azomethine structure.

2. Spectrally sensitized light-sensitive material as described in claim **1**, wherein:

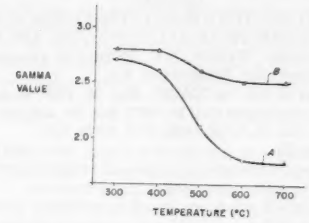
said photoconductor is zinc oxide and said azomethine dye is a zinc azomethine dye complex.

3,867,145

METHANOL AND HEAT TREATED ZINC OXIDE

Satoru Honjo, and Hajime Miyazuka, both of Asaka, Japan, assignors to Rank Xerox, Ltd., London, England

Filed Mar. 19, 1970, Ser. No. 21,007
Claims priority, application Japan, Apr. 5, 1969, 44-26295
Int. Cl. G03g *5/02, 5/08*
U.S. Cl. 96—1.8 **1 Claim**



1. A process for treating photoconductive zinc oxide powder comprising the steps of wetting zinc oxide powder with methanol and thereafter heat treating said zinc oxide at a temperature between about 400°C and about 700°C in an oxidative atmosphere.

3,867,146

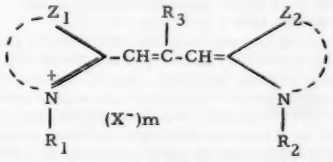
HOLOGRAPHIC REPRODUCTION USING CARBOCYANINE DYE SENSITIZED, FINE-GRAIN SILVER HALIDE EMULSIONS AND NEON-HELIUM LASERS

Yoshiyuki Nakazawa; Yasuharu Nakamura; Tohru Sueyoshi; Shigenori Moriuchi; Akira Sato, and Tadashi Ikeda, all of Minami Ashigara-Kamigun, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 14, 1971, Ser. No. 207,857
Claims priority, application Japan, Dec. 14, 1970, 45-111585
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 H **6 Claims**

1. In a process of making photographic images by exposing a light-sensitive silver halide photographic emulsion to light from a neon-helium laser to produce a latent image, and developing said latent image to form a silver image,

the improvement which comprises said silver halide photographic emulsion being a silver halide photographic emulsion containing silver halide particles having adsorbed thereon at least one sensitizing dye represented by the following general formula (I):



in which Z_1 and Z_2 each represent a benzothiazole nucleus, the benzene ring of said heterocyclic nucleus having at least one substituent selected from the group consisting of

alkoxy, alkyl, phenyl, alkoxycarbonyl, hydroxy and halogen; R_1 (or R_2) represents an alkyl group and R_2 (or R_1) represents a sulfo alkyl group, respectively; R_3 represents a lower alkyl group or an aryl group; X represents an anion; m represents an integer of 0 or 1; and when the dye forms an intramolecular salt, *m* is 0; said dye being present in said silver halide photographic emulsion in an amount sufficient to effectively increase the sensitivity of said silver halide photographic emulsion to light from a neon-helium laser, wherein said silver halide particles have an average particle diameter of not more than 0.18 micron, or wherein at least 95 percent of the total silver halide particles have diameters of not more than 0.2 micron.

3,867,147

LIGHT-SENSITIVE DIAZO COMPOUNDS AND REPRODUCTION MATERIAL EMPLOYING THE SAME

Leon A. Teuscher, Webster, N.Y., assignor to American Hoeschst Corporation, Bridgewater, N.J.

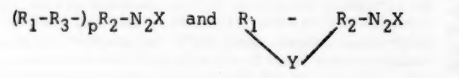
Continuation of Ser. No. 826,297, May 20, 1969, abandoned. This application Oct. 29, 1973, Ser. No. 410,324

Int. Cl. G03f *7/08, 7/12;* **G03c** *1/54*

U.S. Cl. 96—33 **62 Claims**

1. An aromatic diazonium compound comprising repeating units of each of the general types

A - N_2X and B which are linked by methylene groups, in which A-N_2X is a radical of a compound of one of the general formulae



wherein

R_1 is an arylene group of the benzene or naphthalene series

R_2 is a phenylene group

R_3 is a single bond or one of the groups

$-(CH_2)_q-NR_4-$

$-O-(CH_2)_r-NR_4-$

$-S-(CH_2)_r-NR_4-$

$-S-CH_2-CO-NR_4-$

$-O-R_5-O-$

$-O-$

$-S-$ or

$-CO-NR_4-$

the left-hand free valence of the specified groups is attached to R_1 and the right-hand free valence is attached to R_2

wherein

q is a number from 0 to 5

r is a number from 2 to 5

R_4 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, aralkyl with 7 to 12 carbon atoms, and aryl with 6 to 12 carbon atoms,

R_5 is an arylene group having 6 to 12 carbon atoms

—Y— is one of the groups

—NH—, and —O—

X is the anion of the diazonium compound, and

p is a number from 1 to 3, and

B is a radical of a compound selected from the group consisting of aromatic amines, phenols, thiophenols, phenol ethers, aromatic thioethers, aromatic heterocyclic compounds, aromatic hydrocarbons and organic acid amides, in which the aromatic nuclei are unsubstituted or substituted by at least one substituent activating condensation and selected from the group consisting of $-NR_7R_8$, $-N(R_8)_2$, $-OR_7$, $-OR_8$, $-R_8$, and $-SR_8$,

wherein

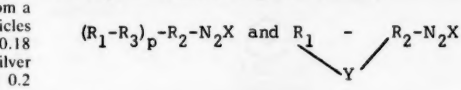
R_7 is -H, -CO-alkyl, -CO-aryl, $-SO_2$-alkyl, $-SO_2$-aryl, $-CONH_2$, or $-CSNH_2$, and

R_8 -H, -alkyl, -aryl or -aralkyl, the alkyl groups having 1 to 10, the aryl groups 6 to 20,

and the aralkyl groups 7 to 20 carbon atoms,

which diazonium compound contains, on the average, about 0.01 to 50 B units per unit of A-N_2X.

30. A process for the preparation of an aromatic diazonium compound which comprises reacting one molar part of at least one compound of one of the general formulae



in which

R_1 is an arylene group of the benzene or naphthalene series

R_2 is a phenylene group

R_3 is a single bond or one of the groups

$-(CH_2)_q-NR_4-$

$-O-(CH_2)_r-NR_4-$

$-S-(CH_2)_r-NR_4-$

$-S-CH_2-CO-NR_4-$

$-O-R_5-O-$

$-O-$

$-S-$ or

$-CO-NR_4-$

the left-hand free valence of the specified groups is attached to R_1 and the right-hand free valence is attached to R_2

wherein

q is a number from 0 to 5

r is a number from 2 to 5

R_4 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, aralkyl with 7 to 12 carbon atoms, and aryl with 6 to 12 carbon atoms,

R_5 is an arylene group having 6 to 12 carbon atoms,

-Y- is one of the groups -NH-, and -O-

X is an anion, and

p is a number from 1 to 3,

and from 0.01 to 50 molar parts of at least one compound free of diazonium groups selected from the group consisting of aromatic amines, phenols, thiophenols, phenol ethers, aromatic thioethers, aromatic heterocyclic compounds, aromatic hydrocarbons and organic acid amides, in which the aromatic nuclei are unsubstituted or substituted by at least one substituent activating condensation and selected from the group consisting of $-NR_7R_8$, $-N(R_8)_2$, $-OR_7$, $-OR_8$, $-R_8$ and $-SR_8$,

wherein

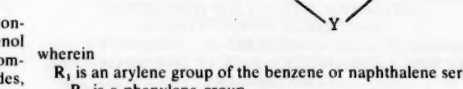
R_7 is -H, -CO-alkyl, -CO-aryl, $-SO_2$-alkyl, $-SO_2$-aryl, $-CONH_2$, or $-CSNH_2$, and

R_8 is -H, -alkyl, -aryl or -aralkyl,

the alkyl groups having 1 to 10, the aryl groups 6 to 20, and the aralkyl groups 7 to 20 carbon atoms, with at least 0.5 molar part of formaldehyde in a strongly acid medium.

35. Light-sensitive material comprising a base material having a layer thereon including an aromatic diazonium compound comprising repeating units of each of the general types A-N_2X and B

which are linked by methylene groups, in which A-N_2X is a radical of a compound of one of the general formulae



wherein

R_1 is an arylene group of the benzene or naphthalene series

R_2 is a phenylene group

R_3 is a single bond or one of the groups

$-(CH_2)_q-NR_4-$

$-O-(CH_2)_r-NR_4-$

$-S-(CH_2)_r-NR_4-$

$-S-CH_2-CO-NR_4-$

$-O-R_5-O-$

—O—
—S— or
—CO-NR_4—
the left-hand free valence of the specified groups is attached to R_1 and the right-hand free valence is attached to R_2
wherein
q is a number from 0 to 5
r is a number from 2 to 5
R_4 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, aralkyl with 7 to 12 carbon atoms, and aryl with 6 to 12 carbon atoms,
R_5 is an arylene group having 6 to 12 carbon atoms
-Y- is one of the groups -NH-, and -O-
X is the anion of the diazonium compound, and
p is a number from 1 to 3, and
B is a radical of a compound selected from the group consisting of aromatic amines, phenols, thiophenols, phenol ethers, aromatic thioethers, aromatic heterocyclic compounds, aromatic hydrocarbons and organic acid amides, in which the aromatic nuclei are unsubstituted or substituted by at least one substituent activating condensation and selected from the group consisting of -NR_7R_8, -$N(R_8)_2$, -OR_7, -OR_8, -R_8 and -SR_8,

wherein
R_7 is -H, -CO-alkyl, -CO-aryl, -SO_2alkyl, —SO_2-aryl, -$CONH_2$, or -$CSNH_2$, and
R_8 is -H, -alkyl, -aryl, or -aralkyl,
the alkyl groups having 1 to 10, the aryl groups 6 to 20, and the aralkyl groups 7 to 20 carbon atoms,

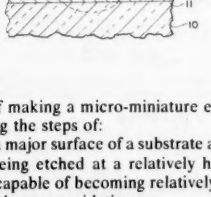
which diazonium compound contains, on the average, about 0.01 to 50 B units per unit of A-N_2X.

3,867,148

MAKING OF MICRO-MINIATURE ELECTRONIC COMPONENTS BY SELECTIVE OXIDATION

Terence W. O'Keeffe, Pittsburgh, and Alan J. Simon, Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1974, Ser. No. 431,656
Int. Cl. C23f *1/02*; **G03c** *5/00*
U.S. Cl. 96—36.2 **5 Claims**



1. A method of making a micro-miniature electronic component comprising the steps of:

A. forming on a major surface of a substrate a layer of metal capable of being etched at a relatively high rate by an etchant and capable of becoming relatively etchant resistant to an etchant on oxidation;

B. applying over the metal layer a resist layer sensitive at least to one type of radiation selected from the group consisting of photons and electrons;

C. defining a desired component pattern in the resist layer by selectively exposing portions of the resist layer to a radiation to which the layer is sensitive to define the component pattern by difference in solubility between the exposed and unexposed portions of the layer;

D. removing the more soluble portions of the resist layer to expose first portions of the metal layer and to leave remaining portions of the resist layer defining the desired component pattern;

E. applying over the exposed first portions of the metal layer and the remaining portions of the resist layer an oxidation masking layer of a thickness less than about 80 percent of the rersist layer thickness, said masking layer being relatively oxidation resistant compared to the metal layer and being relatively etchable compared to the metal layer when oxidized;

F. removing the remaining portions of the resist layer and oxidation masking layer thereover to expose second portions of the metal layer defining the desired component pattern;

G. selectively oxidizing the exposed second portions of the metal layer to form a relatively etchant resistant portion in the metal layer corresponding to the second portions, while the first portions of the metal layer are masked against oxidation by the masking layer; and

H. removing remaining portions of the oxidation masking layer and the underlying unoxidized first portions of the metal layer with an etchant to which the oxidized portions of the metal layer are resistant to leave the oxidized second portions of the metal layer in the desired component pattern defined originally in the resist layer.

3,867,149

FOGGED, DIRECT-POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING A RHODIUM SALT DESENSITIZER AND A BISPYRAZOLONE DYE STABILIZER

Tetsuo Furuya, Ashigara; Hidehiko Ishikawa, and Hideo Kanisawa, both of Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1973, Ser. No. 354,842
Claims priority, application Japan, May 4, 1972, 47-43679
Int. Cl. G03c *1/28, 1/34, 1/36*
U.S. Cl. 96—101 **2 Claims**

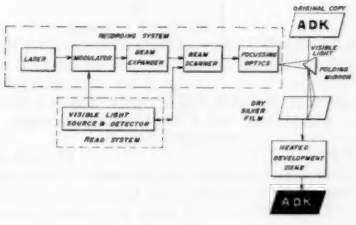
1. A direct-positive light-sensitive silver halide material containing fogged silver halide grains and a rhodium salt as a desensitizer to increase the reversal speed, which material comprises a bis-pyrazolone dye having an absorption maximum in the range from 590 to 690 mμ, which dye is present in an amount of 1 to 500 mg. per 100 cm^2 of the effective area of said sensitive material, said bis-pyrazolone dye having a methine chain connecting two pyrazolone nuclei thereof, said methine chain consisting of 5 unsubstituted methine groups.

3,867,150

PRINTING PLATE PROCESS AND APPARATUS USING A LASER SCANNED SILVER NEGATIVE

Arthur D. Ketley, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed June 8, 1973, Ser. No. 368,170
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.3 **2 Claims**



1. A process for making a photopolymer plate which comprises:

generating a latent image on an optical mask surface by scanning the mask surface with a focussed beam of modulated coherent radiation having a wavelength of about

3,000 A to 8,000 A, said optical mask consisting essentially of a U-V transmissive substrate having coated thereon a photographic emulsion containing silver halide and chemical developing material separated by a heat-releasing encapsulant, to expose the photographic emulsion with said radiation;

thermally developing the latent image on the optical mask by heating the optical mask; and

exposing a photocurable liquid layer on a plate substrate imagewise through said optical mask with U-V light having a wavelength of about 2,000 A to 4,000 A to produce a polymer relief surface corresponding to the developed image.

3,867,151

GENERAL PURPOSE MONOBATH

Jerome Katz, Rochester, N.Y., assignor to Delaware Photographic Products, Inc., Buffalo, N.Y.

Filed May 10, 1973, Ser. No. 358,935

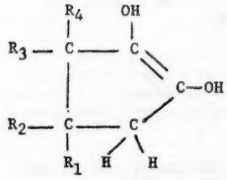
Int. Cl. G03c *5/38, 5/30*

U.S. Cl. 96—61 M **32 Claims**

1. An aqueous composition for the combined developing and fixing of exposed silver halide photographic emulsions, having a pH in the range 9.5 – 10.75, comprising the following ingredients in the weight proportion ranges indicated per liter of composition:

3-pyrazolidone developer	1 to 5 grams
dihydroxybenzene developer selected from the group consisting of hydroquinone, resorcinol and pyrocatechol	8 to 14 grams
aminophenol developer selected from the group consisting of p-aminophenol, N-methyl-p-aminophenol, 2,4-diaminophenol, 2,4-diaminoresorcinol, 6-methyl-2,4-diaminophenol, 5-methyl-2,4-diaminophenol, 4-amino-6-methyl-2-methylaminophenol, 6-amino-4-methyl-2-methylaminophenol, 5-dimethylamino-2-methylaminophenol, 1,2,4,-triaminobenzene, 5-methyl-1,2,4-triaminobenzene, 4-hydroxy,2′,4′-diaminodiphenylamine, 4,2′,4′-triaminodiphenylamine, 1,3-diamino-4,7-dihydroxybenzene, and the acid salts thereof	½ to 3 grams

enediol developer selected from the group consisting of ascorbic acid, d-arabo-ascorbic acid, reductic acid, 2-oxytetronic acid, 4-aryl-2-oxytetronic acid, 4-aryl-2-oxytetronimide, isoascorbic acid and enediols having the chemical structure represented by the formula



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen and the radical $-CH_2R_5$, R_5 is selected from hydrogen and a monovalent radical selected from the group consisting of amino, cyano, halo, hydroxyl, carboxyl, sulfonyl, alkyl, cycloalkyl, aryl of the benzene or naphthalene series and alkaryl of the benzene or naphthalene series, at least one of said R_1, R_2, R_3 and R_4 being the radical $-CH_2R_5$

	1 to 10 grams
inorganic sulfite preservative	20 to 75 grams
alkaline agent	3 to 7 grams
restrainer	¼ to 2 grams
fixing agent selected from sodium, potassium and ammonium thiosulfates and thiocyanates	60 to 110 grams.

8. A composition, as claimed in claim **7**, wherein said inorganic sulfite preservative is selected from sodium and potassium sulfite.

9. A composition, as claimed in claim **7**, wherein said alkaline agent is selected from sodium and potassium hydroxide.

3,867,152

PHOTOGRAPHIC SILVER HALIDE MATERIAL

Jan Jozef Priem, Mortsel; Walter Frans De Winter, Berchem, and Jan Bernard Lambrechts, Antwerpen, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

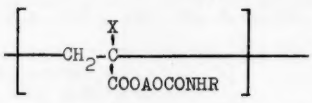
Filed May 29, 1973, Ser. No. 364,327

Claims priority, application Great Britain, June 22, 1972, 29386/72

Int. Cl. G03c *1/04, 5/26*

U.S. Cl. 96—63 **13 Claims**

1. Photographic silver halide material to be further processed comprising a support and at least one silver halide emulsion layer wherein the said emulsion layer or a hydrophilic colloid layer in water-permeable relationship with the said emulsion layer comprises a polymeric compound comprising recurring units of the formula:



wherein:

X is hydrogen or methyl,

A is a straight-chain or branched-chain C_1–C_5 alkylene group, and

R is an alkyl or aryl group.

3,867,153

PHOTOHARDENABLE ELEMENT

Alexander MacLachlan, Middletown, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 11, 1972, Ser. No. 287,666

Int. Cl. G03c *1/76, 1/68*

U.S. Cl. 96—79 **8 Claims**

1. In a photohardenable element, comprising a support, a highly plasticized photohardenable layer and a protective cover sheet, the improvement wherein said photohardenable layer has been hardened to provide narrow continuous regions of hardened material along its edges and wherein the major portion of said photohardenable layer is between said narrow continuous regions and is substantially unhardened and unexposed to actinic radiation, said narrow continuous regions

being at least 0.00005 inches wide and of sufficient width to prevent excessive laminar flow of the photohardenable layer caused by pressure and temperature when the element is stacked sheet or roll form.

3,867,154

DESALINATION OF SILVER HALIDE PHOTOGRAPHIC EMULSIONS UTILIZING SULFATED POLYVINYL ALCOHOL

Joseph Lukeian, Millburn, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed July 23, 1973, Ser. No. 381,650
Int. Cl. G03c *1/02*
U.S. Cl. 96—94 R **4 Claims**

1. In the process of preparing a photographic silver halide composition which comprises forming a fluid emulsion comprising silver halide and gelatin, treating said emulsion to form a coagulate of silver halide and gelatin components thereof, separating said coagulate and the supernatant fluid vehicle of said emulsion, washing said coagulate, and redispersing said silver halide and gelatin components in a fluid vehicle, the improvement wherein said treating comprises the steps, in either order, of:

a. acidifying said emulsion to a pH of about 3.0; and

b. dissolving in said emulsion a sufficient amount of a sulfated polyvinyl alcohol to effect said coagulate formation.

3,867,155

SMOKELESS EXOTHERMIC HOT TOPPING COMPOSITIONS

James A. Davis, Worthington, and Arthur R. Elsea, Columbus, both of Ohio, assignors to Consolidated Ceramic Products, Inc., Blanchester, Ohio

Filed Oct. 31, 1973, Ser. No. 411,401
Int. Cl. B28b *7/36*
U.S. Cl. 106—38.27 **23 Claims**

1. A smokeless exothermic hot topping composition consisting essentially of

an effective exothermic amount of an oxide of iron in finely divided form up to about 50% by weight,

an effective exothermic amount of fuel in finely divided form selected from the group consisting of aluminum and alloys thereof, said amount providing up to about 15% by weight aluminum, with the proviso that as the amount of iron oxide is increased above about 40% by weight towards about 50% by weight said amount of provided aluminum is decreased towards about 10% by weight and when about 50% by weight of iron oxide is reached then the amount of aluminum is no more than about 10% by weight, and

the balance being predominantly composed of inert finely divided filler material, said oxide, fuel and inert material components proportioned to provide said smokeless composition.

3,867,156

PROCESS FOR MANUFACTURING GRANULAR FOAMED PRODUCTS OF SILICA

Kenichi Fukumoto, and Ryuji Nakamura, both of Osaka, Japan, assignors to Shikoku Kaken Kogyo Kabushiki Kaisha, Osaka-fu, Japan

Filed Feb. 16, 1973, Ser. No. 333,365
Claims priority, application Japan, Feb. 21, 1972, 47-18332
Int. Cl. C04b *21/00, 35/14*
U.S. Cl. 106—40 V **11 Claims**

1. A process for manufacturing lightweight, non-hygroscopic foamed product of silica having a high order of mechanical strength and excellent chemical resistance which comprises adding to a silica sol at least one water-insoluble inorganic powder of ceramic raw material, metal oxides other than alkali metal oxides and compound oxides of metal other than alkali metal having a particle size of 0.05 to 100 μ to produce a uniform mixture, gelling the resulting mixture at a pH of not higher than 7 to produce hydrosilica gel, drying the gel obtained to remove sorbed water and firing the dried silica gel at 1000° to 1600°C to effect foaming, said water-insoluble inorganic powder being added to the silica sol in an amouont of 0.1 to 20% by weight, based on the weight of SiO_2 in the sol.

3,867,157

PROCESS AND COMPOSITIONS FOR PORCELAIN ENAMELING

John E. Peeling, Jr., Reisterstown, Md., assignor to SCM Corporation, Cleveland, Ohio

Filed Apr. 17, 1972, Ser. No. 244,901
Int. Cl. C03c *5/02*
U.S. Cl. 106—48 **4 Claims**

1. A porcelain enameling composition comprising coated ceramic frit particles which contain at least about 10 weight percent crystallizable TiO_2 and which have a surface layer containing per 100 weight parts of said frit particles an amount equivalent to at least about 0.001 weight parts of hydrous titania of a titanium compound which will form hydrous titania when heated to a temperature lower than the fusion temperature of said frit particles.

3,867,158

SILICATE GLASS FROM BLAST FURNACE SLAG

John O. Hopkins, Pennington, N.J., assignor to The Calumite Company, Trenton, N.J.

Continuation-in-part of Ser. No. 288,382, Sept. 12, 1972,. This application Feb. 14, 1973, Ser. No. 332,254
Int. Cl. C03c *3/04*
U.S. Cl. 106—51 **9 Claims**

1. The method of producing a transparent glass which consists melting a mixture of glass forming materials consisting essentially of sand, from about 20% to 500% of refined slag based upon the weight of the sand in the mixture, and from about 16 to 100% based on the weight of the sand in the mixture of an agent selected from the group consisting of the sulfates and carbonates of sodium and calcium and mixtures thereof, said refined slag being a blast furnace slag containing less than 0.3% by weight of sulfur.

3,867,159
FOAMED CONCRETE STRUCTURES

Mehmet T. Ergene, Hartford, Conn., assignor to The Stanley Works, New Britain, Conn.

Division of Ser. No. 83,043, Oct. 22, 1970, Pat. No. 3,758,319. This application Sept. 10, 1973, Ser. No. 395,983

Int. Cl. C04b *31/10*

U.S. Cl. 106—88 **4 Claims**

1. A cellular concrete structure comprising a concrete matrix having substantially homogeneously dispersed therethrough a multiplicity of spherical voids of about 0.005 to 0.050 inch average diameter and of relatively narrow size distribution, said concrete matrix comprising cement, a foaming agent, and a chloride cure accelerator, said structure having a uniform density of about 25–75 pounds per cubic foot said structure having been produced by a process comprising the steps:

a. admixing water and cement under conditions sufficient to produce a high degree of hydration of the cement particles;

b. introducing into the hydrated cement admixture a foam formed under pressure from a mixture of water, air, foaming agent and a chloride accelerator in a weight ratio to cement of 0.0035 to 0.01:1.0;

c. blending said cement admixture and said foam mixture sufficiently to produce a substantially homogeneous foamed cement slurry;

d. casting said cement slurry into a mold; and

e. curing said cement slurry to form said lightweight cellular concrete structure with said chloride accelerator being concentrated at the surfaces of the concrete matrix about the voids.

3,867,160
N-HETEROCYCLIC COMPOUNDS AS ADDITIVES TO CEMENT SYSTEMS

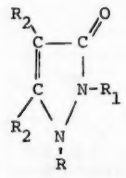
Ronald H. Cooper, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 26, 1973, Ser. No. 345,227

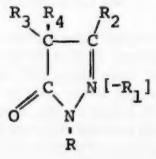
Int. Cl. C04b *7/02*

U.S. Cl. 106—90 **5 Claims**

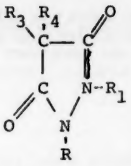
1. A method of producing improved cement mortar, concrete, soil-cement and soil-lime systems which comprises admixing into the system a N-heterocyclic compound selected from the group consisting of a pyrazolone having the formula



or



or a 3,5 pyrazolidindione having the formula



wherein R and R_1 independently may be hydrogen or an organic substituent with at least one of said R and R_1 being organic substituent; R_2 may be hydrogen or an organic substituent; and R_3 and R_4 independently may be hydrogen or an organic substituent or R_3 and R_4 may be one organic substituent connected to the carbon atom by a double bond or IV the enol form of any of the above compounds.

3,867,161
CEMENT ASPHALT BALLAST GROUT COMPOSITION FOR TRACK

Okihiko Torii, Tokyo; Tsutomu Mizunuma, Ohmi; Iwao Mino, Kamakura, and Tetsuya Ando, Tokyo, all of Japan, assignors to Japanese National Railways and Donki Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Sept. 26, 1973, Ser. No. 400,992

Claims priority, application Japan, Sept. 26, 1972, 47-95790

Int. Cl. C04b *7/02*

U.S. Cl. 106—96 **6 Claims**

1. A cement asphalt ballast grout composition for directly joining-type track, which comprises 100 parts by weight of cement, 20 – 400 parts by weight of an asphalt emulsion, 5 – 20 parts by weight of a calcium sulfoaluminate hydrate-forming mineral, 0.1 – 5.0 parts by weight of an electrolyte, 0.01 – 5.0 parts by weight of a thickener and 0.01 – 0.03 part by weight of a foaming agent.

3,867,162
BITUMINOUS EMULSIONS USEFUL WITH MIXTURES OF SILICEOUS AND LIMESTONE AGGREGATE

Edward G. Elste, Jr., Lutherville, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 17, 1970, Ser. No. 99,259

Int. Cl. C08h *13/00*; **C08k** *1/62*; **C09d** *3/24*

U.S. Cl. 106—277 **11 Claims**

1. A modified emulsion consisting essentially of,

a. from about 60 to about 100 parts by weight of a base emulsion having a pH of from about 5 to about 8, said base emulsion comprised of,

a. from about 50 to about 80 parts by weight bitumen,

b. from about 0.05 to about 2.0 parts by weight of a cationic emulsifier,

c. from 0 to about 0.5 part by weight of an acid selected from the group consisting of acetic, phosphoric, hydrochloric, hydrobromic, and sulfamic, and

d. sufficient water to make the total of (a), (b), (c), and (d) equal 100 parts by weight, and

2. from about 0.25 to about 3.0 parts of an adhesion promoter selected from the class consisting of tall oil, crude tall oil, tall oil heads, and tall oil pitch in from 0 to about 30 parts of solvent.

3,867,163
PROCESS FOR REGULATING SETTING TIME OF HYDRAULIC CEMENT

Hiroshi Uchikawa, Funabashi, and Shunichiro Uchida, Chiba, both of Japan, assignors to Onoda Cement Company, Limited, Onoda-shi, Yamaguchi, Japan

Division of Ser. No. 253,352, May 15, 1972,. This application July 6, 1973, Ser. No. 377,111
Int. Cl. C04b *7/02, 13/24*
U.S. Cl. 106—315 **9 Claims**

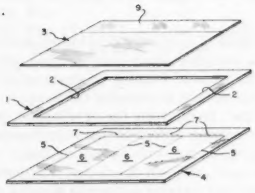
1. A process for regulating the setting time of a hydraulic cement, which comprises the step of:

admixing the retarders of anhydrite and 0.01 – 0.2 weight percent of a monosaccharide, 0.01 – 0.7 weight percent of a disaccharide or 0.05 – 1.00 weight percent of a polysaccharide with a clinker consisting essentially of 5 – 60 weight percent of 11 $CaO.7Al_2O_3.CaX_2$, wherein X represents a halogen atom, and more than 5 weight percent of 3 $CaO.SiO_2$ solid solution, 2 $CaO.SiO_2$ solid solution and 4 $CaO.Al_2O_3.FeO_3$; wherein the anhydrite is present in an amount such that the weight ratio of Al_2O_3 in the clinker to SO_3 in the anhydrite is 0.7 to 1.8.

3,867,164
IMPRINTING DEVICE HAVING CONFORMABLE FILM WITH WET APPLIED INK FOR THE FORMATION OF FINGER AND FOOTPRINTS

Joseph M. Orlando, Parsippany; Harry S. Katz, West Orange, and Jack W. Rainford, Closter, all of N.J., assignors to Identimation Corporation, Northvale, N.J.

Continuation of Ser. No. 225,648, Feb. 11, 9172, abandoned, which is a continuation of Ser. No. 854,700, Sept. 2, 1969, abandoned. This application Aug. 6, 1973, Ser. No. 385,659
Int. Cl. B41m *3/00*
U.S. Cl. 117—.5 **6 Claims**



1. In an imprinting device, the improvement comprising:

a. a thin flat film of impression conforming material which is sufficiently thin and flexible to conform to the impressions and ridges of a relief pattern, such as a fingerprint and the like, when placed in pressure contact with the pattern whereby the surface of the film facing away from the pattern presents a representation of the pattern, said film having smooth and even surfaces and having a generally uniform thickness in a range of about 0.0001 to 0.0010 of an inch, said material comprising:

1. a resinous elastomer, and

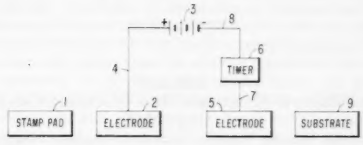
2. a filler having the ink-absorbing and film-flattening properties of diatomaceous earth, uniformly dispersed throughout the resinous elastomer, the surface of the film having less irregularities than would be present without the filler, said filler comprising about 5 to 40 parts per hundred by weight of the resinous elastomer, and

b. a wet, slow drying ink coating adhered to the surface of said film adapted to face away from the pattern upon light pressure contact, with a finger or the like, of said surface with a pattern receiving surface.

3,867,165
METHOD FOR RECORDING FINGERPRINTS

Richard Williams, Princeton, N.J., and Alfred Henry Willis, deceased, late of Princeton, N.J. (by Princeton Bank and Trust Co., executor), assignors to RCA Corporation, New York, N.Y.

Filed Sept. 21, 1973, Ser. No. 399,482
Int. Cl. A61b *5/10*
U.S. Cl. 117—0.5 **6 Claims**



1. A method of recording prints of the body extremities which comprises

a. coating the extremity to be recorded with a reducing agent,

b. passing a current through the reducing agent coating so as to generate electro-oxidation products on the coated extremity and

c. contacting the extremity with a recording medium containing an indicator for the electro-oxidation products to form a permanent image of said extremity on said recording medium.

4. A method of recording fingerprints which comprises

a. coating one or more fingers to be printed with a solution containing potassium iodide,

b. pressing the coated finger or fingers onto a conductive substrate connected to the positive side of a direct current power source,

c. placing another finger or fingers on a second conductive substrate connected to the negative side of the power source, thereby generating free iodine on the surface of the finger or fingers to be printed, and

d. contacting the finger or fingers to be printed onto a starch-containing recording medium to form a permanent fingerprint on said recording medium.

3,867,166
COATED METAL ARTICLE AND METHOD OF MAKING THE SAME

James D. Sullivan, Delafield, Wis., assignor to Tycon, S.p.A., Venice, Italy

Continuation-in-part of Ser. No. 794,403, Jan. 27, 1969, abandoned. This application July 10, 1972, Ser. No. 270,528
Int. Cl. B32b *15/00*
U.S. Cl. 117—23 **12 Claims**

1. A composite structure to be subsequently fired at an elevated temperature, comprising a metal base, and a mixed frit composition disposed on a surface of the base, said composition comprising a mixture of (a) a substantially fully devitrified glass frit composed of an amorphous glass matrix and containing a substantial portion of devitrified crystalline silicate particles and being substantially free of crystobalite particles, and (b) a corrosion resistant substantially non-devitrifiable glass frit containing from 63% to 80% by weight of silica, said mixed frit composition being subsequently fired at an elevated temperature to fuse the composition to the metal, said amorphous glass matrix tending to dissolve in said corrosion resistant glass frit during said firing while retaining the identity of the devitrified crystalline particles to provide a resulting crystalline-glass coating having improved abrasion resistance, impact resistance, and toughness and excellent corrosion resistance.

7. A method of coating a metal article, comprising the step of substantially fully devitrifying a devitrifiable glass frit to produce a devitrified frit composed of an amorphous glass

matrix and a plurality of devitrified crystalline silicate particles dispersed within said matrix, said devitrified glass being substantially free of crystobalite particles, mixing said devitrified glass frit with a corrosion resistant substantially non-devitrifiable glass frit to provide a mixture, applying said mixture to the metal article as a coating, and firing said article at a temperature sufficiently high to fuse said mixture to said metal article, said amorphous glass matrix tending to dissolve in said corrosion resistant glass frit during firing.

3,867,167

METHOD FOR PRODUCTION OF PHOTOGRAPHIC MATERIAL

Sumitaka Tatsuta; Wataru Ueno, and Nobuhiko Minagawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 7, 1971, Ser. No. 187,507
Claims priority, application Japan, Oct. 7, 1970, 45-88134
Int. Cl. B44d *1/12; G03c 1/80*
U.S. Cl. 117—34 **5 Claims**

1. A method for the production of a photographic material, which comprises, in combination, the steps of

a. roughening a biaxially stretched polystyrene film support,
b. irradiating said support with ultraviolet ray,
c. applying to the surface of said film an undercoat layer comprising at least one solvent capable of dissolving or swelling polystyrene and a resin having an affinity to gelatin, and thereafter
d. providing on the undercoat layer a photographic layer comprising an emulsion or suspension containing gelatin as a binder.

3,867,168

TRANSPARENCY

Alptekin Akman, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 6, 1973, Ser. No. 377,167
Int. Cl. B41c *1/06*
U.S. Cl. 117—36.1 **1 Claim**

1. A process of making transparencies comprising:

a. providing a pressure sensitive ink transfer element;
b. sandwiching the transfer element with a transparent substrate having a copolymer of vinyl toluene and alpha methyl styrene coated thereon;
c. pressure sensitizing the sandwiched member in response to telecommunciated signals; and
d. separating the two elements of the sandwich whereby a fixed image is formed on the coated transparency support.

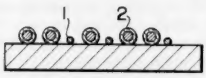
3,867,169

NON-CARBON COPYING UPPER PAPER

Hideo Shimizu, Takasago, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 14, 1972, Ser. No. 280,163
Claims priority, application Japan, Aug. 30, 1971, 46-66412
Int. Cl. B41c *1/06;* **B41m** *5/00*
U.S. Cl. 117—36.2 **10 Claims**

1. A method of producing non-carbon paper comprising coating a paper substrate with a mixture containing therein microcapsules containing an encapsulated dye-oil and microspheres containing a foaming hydrocarbon, said microspheres having a particle size of about 5 microns, and heating said



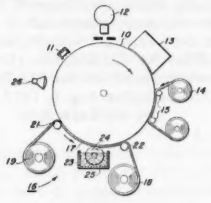
coated paper thus expanding said microspheres to a particle size of 10–70 microns.

3,867,170

METHOD FOR CLEANING LIQUID DEVELOPERS

Robert M. Ferguson, Penfield, N.Y., and Richard J. Komp, Bowling Green, Ky., assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 886,633, Dec. 19, 1969, abandoned. This application Aug. 14, 1972, Ser. No. 280,289
Int. Cl. G03g *13/22;* **B08b** *3/08*
U.S. Cl. 117—37 LE **10 Claims**



1. The method of cyclically developing electrostatic latent images on a reusable electrostatographic imaging surface comprising the steps of forming an electrostatic latent image on the imaging surface, developing the image with an aqueous liquid developer, transferring the developer from the imaging surface to a receiving surface in image configuration, contacting said imaging surface with a cleaning liquid which is miscible with said aqueous liquid developer, distributing said cleaning liquid over said imaging surface to dissolve residual developer liquid and disperse residual developer solids in said cleaning liquid and substantially completely removing the cleaning liquid and residual developer from said imaging surface by moving contact with a dry absorbent fibrous material.

3,867,171

ADHESIVE COLOR PRINTING SYSTEM FOR FLOOR COVERINGS AND OTHER HOME FURNISHINGS FABRICS

Robert Edgewood Ellsworth, Wayne, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 24, 1972, Ser. No. 309,032
Int. Cl. D06p *1/56*
U.S. Cl. 117—38 **8 Claims**

1. A process for coloring textile substrate materials of carpeting, yarns, interlinings and battings of natural and synthetic fibers comprising:

dispersing a pigment in an aqueous dispersion of self-dispersible or emulsifiable polyurethane polymer adhesive containing an aminoplast resin of melamine-formaldehyde, urea, or cyclicurea-formaldehyde condensates and a catalyst for curing the aminoplast resin wherein the polyurethane polymer is obtained by adding

an isocyanate-terminated polyurethane prepolymer having pendant carboxyl groups to water containing a tertiary aliphatic amine and allowing chain extension to proceed until all the isocyanate groups have been reacted,

applying the dispersion to the textile substrate, and

drying the treated substrate.

3,867,172

PRODUCTION OF FLAT MATERIALS PRINTED WITH PIGMENTS

Guenter Uhl, Worms; Karl Dachs; Herbert Helfert, both of Frankenthal, and Rolf Fikentscher, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed May 29, 1973, Ser. No. 364,942

Claims priority, application Germany, June 2, 1972, 2226938

Int. Cl. C09d *7/08*

U.S. Cl. 117—38 **7 Claims**

1. In a process for the printing of a flat porous material in bright and deep shades with a print paste containing a pigment dye, the improvement which comprises printing said material with a print paste consisting essentially of at least one pigment dye, a binder, a thickener, water and from 1 to 6 percent by weight, based on the whole paste, of an ester of an aliphatic, saturated or monounsaturated, linear monocarboxylic acid of 10 to 20 carbon atoms and a saturated, branched or linear monohydric alcohol of 4 to 30 carbon atoms or a mixture or such esters which is present in the paste at 40°C as an emulsified liquid.

3,867,173

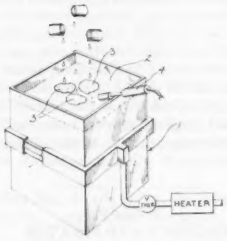
METHOD OF DECORATING OBJECTS WITH WAX

Raymond M. Putzer, Racine, Wis., assignor to Lenox Candles, Inc., Oshkosh, Wis.

Filed May 21, 1973, Ser. No. 362,180

Int. Cl. B44d *1/04, 1/06*

U.S. Cl. 117—39 **9 Claims**



1. A method of decorating an object with wax, comprising immersing the object in a water bath in contact with a molten film of multi-colored wax floating on said bath while maintaining the bulk water temperature of said bath substantially below the melting point of the wax, and supplying heat to the film of wax to maintain the same at a temperature substantially above its melting point.

3,867,174

BATHS FOR ACTIVATING THE SURFACE OF PLASTICS TO BE CHEMICALLY METAL-PLATED

Hiroshi Maekawa, Osaka, and Choji Yamauchi, Fuse, both of Japan, assignors to Giichi Okuno, Osaka-shi, Japan

Filed Feb. 13, 1970, Ser. No. 14,900

Claims priority, application Japan, Aug. 6, 1965, 40-47912

Int. Cl. B44d *1/092;* **C23c** *3/02*

U.S. Cl. 117—47 A **6 Claims**

1. A process for preparing an activated polymer surface which consists essentially of contacting a clean non-active unconditioned polymer surface with a liquid activating composition containing at least one reactive conditioning agent in combination with at least one ion of a metal selected from the group consisting of platinum, palladium, silver and gold, wherein the reactive conditioning agent contains sulfuric acid and chromic acid and wherein the polymer surface contains acrylonitrile-butadiene-styrene terpolymer.

3,867,175

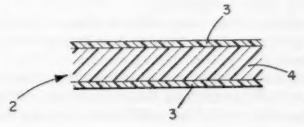
NON-FOGGING MATERIAL

Ralph William Dornte, Lower Southampton Township, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Continuation-in-part of Ser. Nos. 86,883, Nov. 4, 1970, Pat. No. 3,726,703, and Ser. No. 174,135, Sept. 30, 1971, Pat. No. 3,766,299. This application Sept. 28, 1972, Ser. No. 292,939The portion of the term of this patent subsequent to Apr. 10, 1990, has been disclaimed.

Int. Cl. C09k *3/18;* **C03c** *17/32*

U.S. Cl. 117—47 A **13 Claims**



1. A non-fogging material comprising a normally fogging substrate having on at least one surface thereof a non-fogging, water insoluble, hydrophilic polymeric coating comprising a polyalkylene imine having substantially all of its nitrogen atoms attached to a plurality of reactive compounds, at least one of said reactive compounds being a cross-linking compound having at least two functional groups capable of reacting with the polyalkylene imine selected from a nonaromatic ethylenic unsaturated group, an epoxy group, a halo group, a carboxylic acid or anhydride group, an aldehyde group, a ketonic group, an isocyanato or isothiocyanato group and a phenolic hydroxy group and another polyfunctional reactive compound containing a polar functional group to promote adhesion to the substrate selected from a cyano group, an amido group, an acetyl group and an aryl group and having at least two functional groups selected from a nonaromatic ethylenic unsaturated group, an epoxy group, a halo group, a carboxylic acid or anhydride group, an aldehyde group, a ketonic group, an isocyanato group or isothiocyanato group and a phenolic hydroxy group, said reactive compounds being reacted with the polyalkylene imine in an amount of at least one reactive equivalent per equivalent weight of the polyalkylene imine.

3,867,176

METHOD FOR PLATING RACE-TYPE ASSEMBLIES

James T. Dalton, Knoxville, and Ralph R. Wright, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Oct. 12, 1973, Ser. No. 406,050
Int. Cl. C23c *3/02*; C23f *1/04*
U.S. Cl. 117—50 6 Claims

1. The method of converting an assembled, low-carbon-steel bearing of the type having inner and outer races to a nickel-plated assembly having substantially the same dimensions throughout as said bearing comprising:

a. degreasing the surfaces of said bearing in the assembled state;
b. chemically etching the surfaces of the resulting degreased assembly;
c. chemically milling the resulting etched assembly to remove from the surface thereof a selected amount of metal;
d. chemically etching the surfaces of the resulting milled assembly;
e. chemically nickel plating the resulting milled and etched assembly to replace with deposited nickel the amount of metal removed by said milling; and
f. providing relative movement between said inner and outer races in the course of operations (a), (b), (c), and (e).

3,867,177

IMPREGNATION OF POROUS BODY WITH METAL

Jack J. Ott, Hemlock; Russell E. Matthews, Midland, and Garth D. Lawrence, Laingsburg, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1972, Ser. No. 215,685
Int. Cl. B22d *27/16*; C23c *17/00*
U.S. Cl. 117—51 19 Claims

1. A process for impregnating a solid porous body having interconnecting pores comprising:

a. contacting the porous body with a molten activator metal, the activator metal characterized as being inert to the porous body,
b. solidifying the activator metal within the porous body,
c. at least partially immersing the porous body of step (b) in a molten filler metal for a sufficient time for the filler metal to at least partially replace the activator metal within the porous body, the activator metal being at least partially soluble in the filler metal,
d. removing the porous body from the molten filler metal, and
e. solidifying the metal within the porous body.

3,867,178

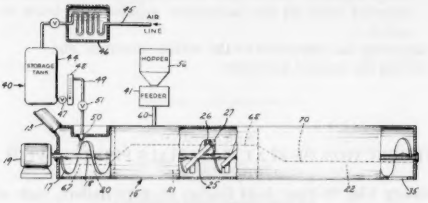
METHOD FOR COATING DISCRETE PARTICLES

James R. Ritter, Ridgewood, and Otto R. Strauch, Wyckoff, both of N.J., assignors to Potters Industries Inc., Carlstadt, N.J.

Filed Sept. 5, 1972, Ser. No. 286,059
Int. Cl. B44d *1/14*
U.S. Cl. 117—69 11 Claims

1. A continuous method for coating discrete particles which comprises, in combination:

continuously advancing a mass of discrete particles to be coated along a feed path;
applying an amino type coupling agent to the particles at a first predetermined point along the feed path to provide an uncured coating on the surface of each particle;
initiating the curing of the coupling agent coating by the application of heat thereto as the particles continue their movement along the feed path;
adding an anti-caking agent to the coated particles at a second predetermined point along the feed path; and
completing the curing of the coupling agent coating by continuing the application of heat thereto as the particles



move along the feed path downstream of said second predetermined point.

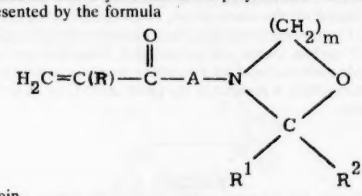
3,867,179

COATED POLYMERIC FIBERS

William H. Page, 1830 Palisades Dr., Appleton, Wis. 54911

Continuation-in-part of Ser. No. 295,620, Oct. 6, 1972, abandoned. This application Apr. 9, 1973, Ser. No. 349,508
Int. Cl. B44d *1/16*
U.S. Cl. 117—76 F 10 Claims

1. A sheet of polymeric material coated with two coatings of a mixture of a clay material and a polymer of an oxazolidine represented by the formula



wherein

R is H or CH_3,

m is an integer having a value of 2 to 3,

R^1, when not directly joined to R^2, is selected from the group consisting of hydrogen, phenyl, benzyl, and (C_1–C_{12}) alkyl groups,

R^2, when not directly joined to R^1, is selected from the group consisting of hydrogen and (C_1–C_4) alkyl groups,

R^1 and R^2, when joined together, are selected from the group consisting of pentamethylene and tetramethylene, and A is $-O(CH_2)_m-$ or (O-alkylene)$_n$ in which (O-alkylene)$_n$ is a poly(oxyalkylene) group, having a molecular weight in the range from 88 to 348, in which the individual alkylene radicals are the same or different and are either ethylene or propylene, wherein the mixture is used in a tie-coat, as the first coating, and in an overcoat, as the second coating, wherein the tie-coat has a ratio, by weight, of the clay to the polymer of oxazolidine ranging up to 1 to 1, and wherein the overcoat has a ratio, by weight, of the clay to the polymer of oxazolidine greater than 1 to 1.

3,867,180

PRODUCT AND PROCESS

Mary Margaret Schick, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed May 24, 1973, Ser. No. 363,664
Int. Cl. B44d *1/08*, *1/16*
U.S. Cl. 117—76 FB 5 Claims

1. A process for reducing the noise in compressible fibrous structures when flexed under stress, which comprises:

spraying a reticulated batt of randomly arranged, microcellular, inflated closed-cell, pneumatic fibers of a synthetic organic polymer with between about 0.03 to about 5 percent by weight based on the weight of the fibers of an anti-adhesive comprising an aqueous dispersion of a compound selected from the group consisting of a polyoxyethylene polyoxypropylene polymethylsiloxane contain-

ing about 51% polyoxyethyiene, a sodium alkylsulfonate of 22 to 24 carbon atoms and a polyoxyethylene polyoxypropylene glycol containing about 80% polyoxyethylene; coating said sprayed batt with an adhesive binder comprising an aqueous emulsion of at least 40% by weight of an ethylene/vinyl acetate copolymer wherein the vinyl acetate comprises 18–40% by weight of the polymer; and drying the coated batt.

3,867,181

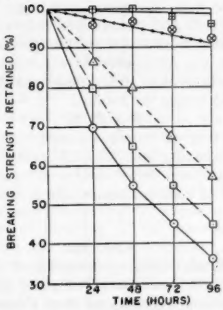
STABILIZED POLYESTER YARN HAVING A CARBODIIMIDE COATING AND PROCESS OF MAKING

Luis R. Vizurraga, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 628,031, April 3, 1967, abandoned. This application Dec. 21, 1970, Ser. No. 100,490

Int. Cl. B32b *25/02, 27/36*

U.S. Cl. 117—80 **6 Claims**



1. An industrial yarn of a linear polymeric terephthalic acid ester of a glycol of the series $HO(CH_2)_nOH$ where n is greater than 1 but not exceeding 10; said ester having free carboxyl end groups and said yarn being stabilized against hydrolytic and thermal degradation by having a carbodiimide coating disposed thereon in amounts sufficient to produce a pickup in the range from 1% to about 2.5% by weight; said carbodiimide being a compound represented by the following general formula

$$R'—N=C=N—R$$

wherein R and R′ are radicals independently selected from the group consisting of aryl, alkyl, aralkyl and alkoxy radicals.

3,867,182

TUBULAR CASING OF CELLULOSE HYDRATE WITH A FAT AND WATER REPELLENT INNER SURFACE AND PROCESS FOR THE MANUFACTURE THEREOF

Klaus-Dieter Hammer, Finthen; Wolfgang Klendauer, Wiesbaden, and Erich Schuierer, Altoetting, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 3, 1973, Ser. No. 420,965

Claims priority, application Germany, Dec. 6, 1972, 2259671

Int. Cl. B44d *1/02*

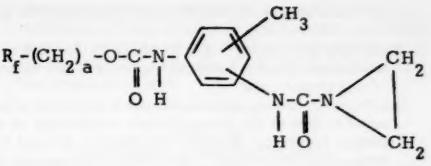
U.S. Cl. 117—95 **18 Claims**

1. A tubular casing of cellulose hydrate having a coating on its inner side composed of a mixture of substances cross-linked by chemical reaction, which mixture is obtained when an aqueous liquid containing

A. 1 to 10 per cent by weight, calculated on the total weight of the liquid, of a water-soluble aminoplast precondensate,

B. 1 to 4 per cent by weight, calculated on the total weight of the liquid, of a fluorine-containing two-component system from

β_1. polymers of fluorine-containing ethylene imines of the general formula

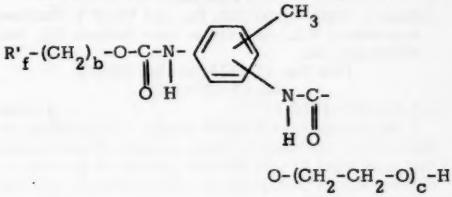


wherein

R_f is a straight or branched, saturated perfluorinated carbon chain with 6 to 10 carbon atoms,

and a = 1 or 2, or polymers from mixtures of the said ethylene imines, dispersed in

β_2. fluorine-containing compounds of the general formula



wherein

R'_f is a straight or branched, saturated perfluorinated carbon chain with 5 to 7 carbon atoms,

b = 1 or 2,

and c = 18 to 50 (corresponding to polyethylene glycol groups with an average molecular weight of about 800 to 2,000),

or in mixtures of the above compounds, provided that, in the component B of the liquid, the ratio β_1 to β_2 is in the range from 40 : 60 to 60 : 40 per cent by weight, calculated on the total weight of the liquid, and

C. a water-soluble cross-linking catalyst is heated sufficiently to remove the portion of the liquid consisting of water and sufficiently to effect cross-linking, whereby the aminoplast precondensate and/or reaction products of the aminoplast precondensate and the constituents β_1 and β_2 of the component B are chemically bonded with the OH groups of the cellulose hydrate forming the tubular casing.

3,867,183

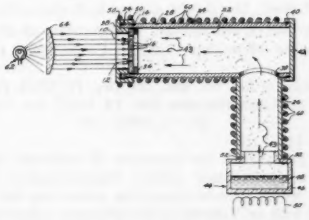
METHOD OF COATING CHANNELED ENERGY-CONDUCTING PLATES

Henry B. Cole, East Woodstock, Conn., assignor to American Optical Company, Southbridge, Mass.

Filed Apr. 8, 1966, Ser. No. 541,940

Int. Cl. C23c *11/02*

U.S. Cl. 117—107.2 R **2 Claims**



1. In a method of gas plating the walls of channels of a multi-channeled electron amplifying element by thermal decomposition of a metal plating vapor continually directed

through said channels, the improvement comprising the steps of:

preheating said plating vapor to nearly its decomposition temperature prior to entrance thereof into said channels of said element; and

intermittently heating said element to a temperature at least equal to that of the decomposition temperature of said plating vapor and allowing said element to cool to a temperature below said decomposition temperature during intervals between said intermittent heating to effect flushing of residue gases of said vapor in said channels by said continuous flow thereof during said intervals.

3,867,184

COATING

Alfonso L. Baldi, Drexel Hill, Pa., and Victor V. Damiano, Pennsauken, N.J., assignors to Alloy Surfaces Co., Inc., Wilmington, Del.

Filed Jan. 31, 1973, Ser. No. 328,378

Int. Cl. C23c *9/00*

U.S. Cl. 117—107.2 P **4 Claims**

1. In the process of diffusion coating a metal article, the improvement according to which a single diffusion coating heat is arranged to coat different portions of the article in different ways by maintaining the different portions in contact with different diffusion coating packs.

3,867,185

METHOD OF PRODUCING A LITHIUM-DEPLETED PATTERNED SURFACE ON A LITHIUM NIOBATE CRYSTAL

William L. Primak, Hinsdale, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 17, 1973, Ser. No. 398,266

Int. Cl. B44d *5/12*

U.S. Cl. 117—118 **2 Claims**

1. A method of producing a lithium-depleted surface layer on a lithium niobate crystal comprising bombarding the crystal surface with H^+, D^+, He^+, or Ne^+ ions, exposing the bombarded crystal to an atmosphere containing water vapor whereby lithium hydroxide forms as a decoration on the surface, repeatedly washing the surface with water as the decoration phenomena occurs, and heating the washed crystal to about 320°C., thereby immobilizing the remaining lithium to prevent further lithium migration to the bombarded areas.

3,867,186

METHOD OF TREATING CELLULOSIC MATERIAL WITH N-METHYLOL PHOSPHAZENE COMPOUNDS AND PRODUCT OBTAINED

Edwin O. Hook, Marshfield; George R. Berbeco, Chestnut Hill, and Arthur S. Obermayer, West Newton, all of Mass., assignors to Moleculon Research Corporation, Cambridge, Mass.

Division of Ser. No. 886,329, Dec. 18, 1969, Pat. No. 3,711,542. This application Dec. 19, 1972, Ser. No. 312,234

Int. Cl. C09d *1/00*

U.S. Cl. 117—136 **18 Claims**

1. A process for the treatment of cellulosic material to impart crease-resistant and/or flame-retardant properties thereto, which process comprises contacting the cellulosic material with an N-methylol phosphazene compound and an acid catalyst at a pH of between about 4.0 and 6.5, and at a temperature sufficient to effect a condensation reaction between the hydroxyl groups of the cellulosic material and the N-methylol groups of the phosphazene compound.

3,867,187

POLYPROPYLENE FILAMENTS HAVING IMPROVED SOILING AND CROCKING CHARACTERISTICS

David E. Borenstein, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 26, 1973, Ser. No. 344,878

Int. Cl. B44d *1/098*

U.S. Cl. 117—138.8 E **18 Claims**

1. A filament melt spun from an admixture of a filament forming polymer of propylene and at least one wax compound having the formula

$$\left(C_xH_{2x+1}\right)-\overset{O}{\overset{\|}{C}}-\overset{H}{\overset{|}{N}}-\left(C_yH_{2y}\right)-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-\left(C_zH_{2z+1}\right)$$

wherein x and z are integers in the range of 10 to 25 and y is an integer in the range of 2 to 10; said polymer of propylene being selected from the group consisting of fiber forming homopolymers of propylene, fiber forming copolymers of propylene and at least one other monoolefin having up to 8 carbon atoms, and admixtures thereof; said filament having a finish coating thereon of at least one quaternary ammonium salt compound having the formula

$$R_2R'_2N^+X^-$$

wherein each R is individually selected from saturated hydrocarbyl radicals having from 10 to 25 carbon atoms, each R′ is individually selected from saturated hydrocarbyl radicals having from 1 to 8 carbon atoms, and X is a halogen radical.

3,867,188

SPUNBONDED NONWOVEN FABRIC

Paul E. Campbell, Greensboro, N.C., and John G. Kokoszka, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed July 25, 1973, Ser. No. 382,601

Int. Cl. B44d *5/08;* **C08g** *31/18*

U.S. Cl. 117—138.8 F **13 Claims**

1. A spunbonded nonwoven fabric having thereon a silicone-glycol copolymer having the general formula

$$(CH_3)_3SiO\ (CH_3)_2SiO_x\ (CH_3)GSiO_ySi(CH_3)_3$$

wherein

G is a radical of the structure $-R(OC_3H_6)_zOH$,

R is an alkylene radical containing from 1 to 18 carbon atoms,

x has an average value of from 40 to 90,

y has an average value of from 1 to 10, and

z has an average value of from 1 to 10.

3,867,189

IMPERMEABLE, NONPOROUS POLYARYLENE SULFIDE LAMINATE AND PROCESS THEREFOR

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 29, 1973, Ser. No. 327,733

Int. Cl. C08d *13/24;* **B28b** *7/28*

U.S. Cl. 117—138.8 UA **16 Claims**

1. An impermeable laminate structure comprising a molded porous arylene sulfide polymer composition having applied to the surface thereof a cross-linked nonporous arylene sulfide polymer coating.

7. A laminate structure according to claim 1 wherein said laminate is in the form of a conduit.

9. A process of making a laminate structure which comprises

a. forming a slurry of a porous arylene sulfide polymer in a volatilizable liquid;

b. compressing the resulting slurry so as to form a molded article containing therein at least 0.1 weight percent residual volatilizable liquid;

c. heating the resulting molded article at a first temperature so as to substantially volatilize the residual liquid therein;

d. thereafter, further heating the resulting substantially liquid-free molded article at a second temperature so as to substantially cure the polymer;
e. thereafter applying a continuous layer of a nonporous arylene sulfide polymer to at least one surface of said molded article;
f. thereafter, further heating the resulting coated article at a third temperature so as to substantially cure the coating polymer; and
g. thereafter recovering the resulting laminate structure containing poly(arylene sulfide) composition as a product of the process.

3,867,190
REDUCING CAPILLARITY OF POLYGLYCOLIC ACID SUTURES

Edward Emil Schmitt, and Martin Epstein, both of Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

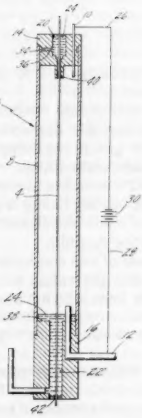
Continuation-in-part of Ser. No. 190,290, Oct. 18, 1971, Pat. No. 3,736,646. This application Apr. 24, 1973, Ser. No. 354,043
Int. Cl. B44d *1/098*; **A61l** *17/00*
U.S. Cl. 117—138.8 A **4 Claims**

1. A process for reducing the capillarity of a multifilament polyglycolic acid surgical suture comprising contacting a multifilament polyglycolic acid strand with an organic solvent solution of a copolymer of 15 to 85 mole percent glycolic acid and 85 to 15 mole percent lactic acid, thereby filling the interstices of said multifilament polyglycolic acid strand with the said solution, evaporating off the solvent, and thereby leaving a stiffening and capillarity reducing quantity of said copolymer on the multifilament polyglycolic acid strand, thus forming a surgical suture, said multifilament polyglycolic acid strand being insoluble in said organic solvent and said copolymer being soluble in said organic solvent.

3,867,191
CARBON-BORON SURFACED CARBON FILAMENT

Francis S. Galasso, Manchester, and Richard D. Veltri, Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 24, 1972, Ser. No. 228,953
Int. Cl. C23c *11/08*
U.S. Cl. 117—169 R **6 Claims**

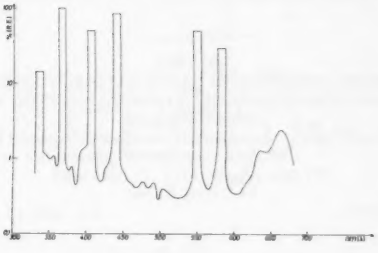


1. A composite filament at least two mils in diameter having a tensile strength of at least 150,000 psi for use as reinforcement in metal matrix composite articles comprising:
a substrate consisting essentially of carbon filament;
a continuous coating adhered to said substrate consisting essentially of carbon-boron alloy, said coating consisting essentially of approximately 43–60 atomic percent carbon, remainder boron.

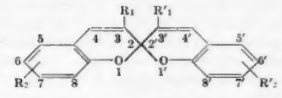
3,867,192
ELECTRON BEAM RECORDING

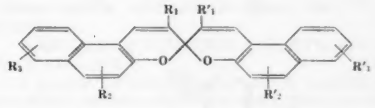
Theofiel Eveline Hermans, Boechout, and Gerard Albert Delzenne, S-Gravenwezel, both of Belgium, assignors to AGFA-Gevaert, Mortsel, Belgium

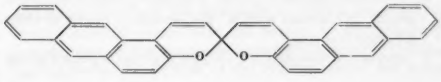
Filed Feb. 26, 1973, Ser. No. 335,671
Claims priority, application Great Britain, Feb. 29, 1972, 9398/72
Int. Cl. G01d *15/14*, *15/34*
U.S. Cl. 117—201 **5 Claims**

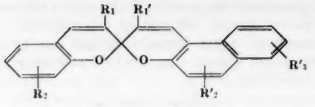


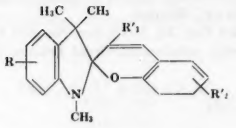
1. An electron beam-sensitive recording material which comprises an electrically conductive substrate and superposed thereon a layer that has a sensitivity to ultra-violet radiation not high enough to provide an optical density result in the visible spectrum range of more than 0.2 when tested under the standard test conditions described in the specification, said layer comprising:
A. at least one dye precursor compound corresponding to one of the following general formulae:

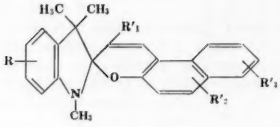


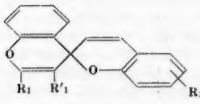






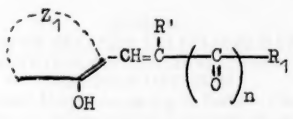


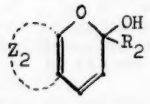




wherein:

R, R_1, R'_1, R_2, R'_2, R_3 and R'_3 each represent hydrogen, alkyl, alkyl substituted with halogen, alkyl substituted with an ester group, alkyl substituted with a carboxyl group, alkyl substituted with a N-phenylcarbamyl group, a hydroxy group, an alkoxy group, an aryloxy group, a phenyl group, piperidyl, acetyl, halogen, nitro, or R_1 and R'_1 together represent a $-(CH_2)_n-$ chain wherein n=2 or 3 to link the carbon atoms in the 3 and 3′ positions together or





wherein:

R_1 represents an alkyl group, a phenyl group, a naphthyl group, or together with R′ the necessary atoms to close a cyclohexyl ring,

R′ represents hydrogen, a C_1–C_5 alkyl group, a phenyl group or a phenoxy group,

Z_1 represents the necessary atoms to close a phenyl or naphthyl nucleus,

Z_2 represents the necessary atoms to close a benzene or naphthalene nucleus,

R_2 represents a C_1–C_5 alkyl group, and

n represents 1 or 2, and

B. at least one organic compound of the group consisting of:

1. an organic compound containing one or two halogen atoms linked to the same carbon atom that is further linked to at least one electron-withdrawing group selected from the group consisting of a

$$>C=O,\ >SO_2,\ -C\equiv N,\ -N_3,\ -NO_2$$

or phenyl group,

2. an organic compound containing at least one nonhalogen carrying carbon atom bound to at least one hydrogen atom and at least two electron-withdrawing groups selected from the group consisting of

$$>C=O,\ >SO_2,\ -C\equiv N,\ -N_3 \text{ and } -O-\overset{\overset{O}{\|}}{C}-R$$

in which R is an organic group, and

3. a polyhalogenated aromatic hydroxy compound.

3,867,193

PROCESS OF PRODUCING A THIN FILM CIRCUIT

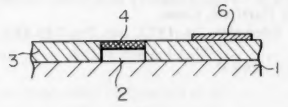
Norio Sumi, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1971, Ser. No. 195,937

Claims priority, application Japan, Dec. 28, 1970, 45-19262; Dec. 28, 1970, 45-19263; Dec. 28, 1970, 45-19264

Int. Cl. B44d *1/18*

U.S. Cl. 117—212 **3 Claims**



1. A process of producing a C-R thin film circuit which comprises the steps of:

a. depositing an electrically conductive thin film on an insulating substrate, said thin conductive film being selected from the group consisting of tantalum nitride, tantalum, niobium, and hafnium;

b. coating onto said conductive film an oxidation preventing mask, said mask coating having a pattern corresponding to the contour of a thin film element desired to be formed on said conductive thin film;

c. oxidizing portions of said conductive thin film not coated with said oxidation preventing mask to product an insulating oxide film layer which has a thickness larger than that of said conductive thin film and insulates the mask-coated portions of said conductive thin film at side surfaces thereof;

d. removing said oxidation preventing mask to expose the portions of said conductive thin film at upper surfaces thereof, said exposed portions of said conductive thin film which have not been oxidized being insulated at said side surfaces with said insulating oxide film layer;

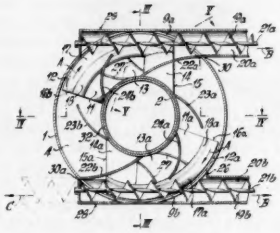
e. anodizing the upper surface of said nonoxidized conductive film to form a thin film dielectric layer over the remaining non-oxidized conductive film; and,

f. depositing a metal film in a predetermined pattern on said dielectric layer to form a thin film capacitor element.

3,867,194
DIFFUSION TOWER CONSTRUCTION

Elmar Straube, Bedburg, Germany, assignor to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed May 10, 1973, Ser. No. 359,027
Claims priority, application Germany, May 18, 1972, 2224209
Int. Cl. C13d *1/12*
U.S. Cl. 127—5 **16 Claims**



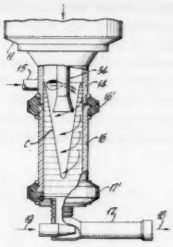
1. In a diffusion tower, a combination comprising a stationary outer conduit and a coaxial rotatable inner conduit defining with said outer conduit an annular diffusion chamber having an upper region; agitating means for agitating a stream of material which moves upwardly in said chamber in a direction towards said upper region; outlet means in said outer conduit in said upper region; screw conveyor means in said upper region and extending through said outlet means from the interior to the exterior of said outer conduit, tangentially of the latter; expelling means mounted on said inner conduit for rotation therewith in said upper region, so as to expel material towards said outlet means, said expelling means comprising an expelling member extending transversely of said chamber and having a circumferentially leading and a circumferentially trailing edge, a radially outer marginal portion which extends from one to the other of said edges, and an upper surface having a major portion which is inclined from said leading toward said trailing edge except for said marginal portion where said surface slopes down to a planar surface portion which is located in the plane of said leading edge and closely beneath said screw conveyor means; and guide baffles arranged in said upper region and having lower edges which are located above said expelling member, extending transversely of said chamber and being contoured to correspond to the contour of said upper surface.

3,867,195
APPARATUS FOR CONTINUOUS PRODUCTION OF SYRUP

Anton Pfeuffer, 301 E. 78th St., New York, N.Y. 10021

Filed Aug. 25, 1972, Ser. No. 283,675
Int. Cl. B01f *1/00*
U.S. Cl. 127—22 **7 Claims**

1. Apparatus for continuously producing sugar syrup comprising a mixing chamber, vortex means for establishing an aqueous vortex in said mixing chamber, means delivering sugar crystals to said vortex whereby said mixing chamber is constituted as means within which a syrup is formed, an outlet from said mixing chamber leading to a suction inlet of an ejector whereby syrup from said outlet is delivered to a remote location and means recirculating at least a portion of said

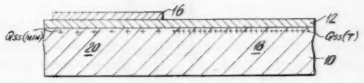


syrup from the remote location to a motive fluid inlet of said ejector.

3,867,196
METHOD FOR SELECTIVELY ESTABLISHING REGIONS OF DIFFERENT SURFACE CHARGE DENSITIES IN A SILICON WAFER

Paul Richman, Saint James, N.Y., assignor to SMC Microsystems Corporation, Hauppauge, L.I., N.Y.

Filed Mar. 11, 1974, Ser. No. 450,178
Int. Cl. H01l *7/34*
U.S. Cl. 148—1.5 **6 Claims**



1. A process for fabricating a semiconductor integrated circuit comprising the steps of providing a silicon substrate, forming a silicon dioxide layer over said silicon substrate, forming a film of a material having the characteristic of acting as a barrier to oxygen over a selected portion of said oxidized silicon substrate, and thereafter subjecting said silicon substrate to an anneal in an oxygen-containing atmosphere, whereby a minimum value of Qss is established in said portion of said silicon substrate underlying said oxygen-barrier film and a higher value of Qss is established in the remaining portion of said silicon substrate.

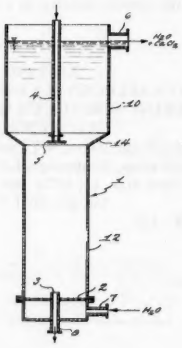
3,867,197
PROCESS FOR THE RELEASING OF MATERIALS FROM VOLUMINOUS PRECIPITATES OR SUSPENSIONS

Helmut Reinhardt, Rodenkirchen; Karl Trebinger, and Gottfried Kallrath, both of Wesseling, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt/Main, Germany

Filed Mar. 20, 1973, Ser. No. 343,170
Claims priority, application Germany, Mar. 27, 1972, 2214826
Int. Cl. B01d *12/00;* **C01b** *33/18;* **C01c** *3/12*
U.S. Cl. 134—25 R **8 Claims**

1. A process for removing water soluble material from a voluminous suspension of solid material in water in an apparatus comprising a vertical column, said column having an upper widened portion, a lower narrow portion, and a frustoconical portion connecting said upper and lower portions, the cross-section of the upper portion being approximately twice that of the lower portion, first conduit means for introducing said suspension extending from above through said upper portion and terminating near the bottom of the frustoconical portion, second conduit means near the bottom of the column for introduction of wash water, substantially horizontal distributing means in the bottom of the column above the second

conduit means, first discharge conduit means at the bottom of said column for discharging purified suspension, said first discharge conduit means extending from slightly above the distributing means through said distributing means to a point below the introduction of the wash water, and second discharge exit in the upper portion of the column for removing wash water containing solubles released from the voluminous suspension, said upper discharge exit being at a point above the introduction of the suspension into the column, said process comprising introducing said suspension through said first conduit means, introducing wash water through said second conduit means, continuously passing the suspension downwardly through said column in countercurrent flow to upwardly flowing wash water and thereby transferring the water soluble material to the upwardly flowing wash water, the velocity of upward flow being lower in the upper widened portion of the column than in the lower narrowed portion, separating the thus purified suspension from the wash water, discharging the purified suspension from the bottom of the column downwardly through said first discharge conduit means and discharging the wash water containing solubles released from the voluminous suspension through said second discharge exit.



3,867,198

METHOD OF CLEANING THE SURFACE OF A DECORATIVE PLASTIC LAMINATE

Dennis Ronald Lovitt; Gene Edward Grosheim, both of Cincinnati, and Richard Frederick Jaisle, Harrison, all of Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed June 13, 1973, Ser. No. 369,661
Int. Cl. B08b *3/10*
U.S. Cl. 134—29 **6 Claims**

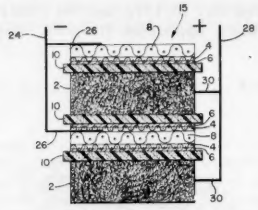
1. A process for removing contaminants imparted to the melamine/formaldehyde resin containing surface of a decorative laminate by an aluminum release sheet used during the manufacture of the laminate, which comprises contacting the contaminated decorative laminate surface, for from about 1 second to about 15 seconds, with a cleaner consisting essentially of a solution of from about 2.5% to about 50.0%, by weight, based on the total weight of the solution, of an alkali metal hydroxide, said solution having a temperature of from about 30°C. to about 90°C.

3,867,199

NICKEL HYDROGEN CELL

James D. Dunlop, Gaithersburg, Md.; Jose Giner, Sudbury, Mass.; Gerrit Van Ommering, Adelphi, and Joseph F. Stockel, Gaithersburg, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed June 5, 1972, Ser. No. 259,524
Int. Cl. H01m *43/04*, *27/00*
U.S. Cl. 136—28 **12 Claims**



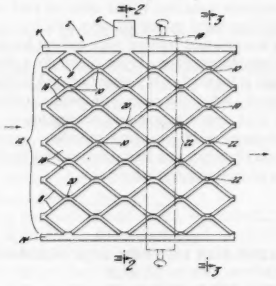
1. A rechargeable Ni/H_2 power cell essentially including a case, a plurality of positive electrodes in said case each positive electrode comprising $Ni(OH)_2$ in the discharged state, at least one dual porosity negative electrode in said case comprising two conductive supports having a catalyst disposed in a hydrophobic non-conducting matrix mounted on each of said supports and means between said supports for providing passages for diffusion of gas to said catalyst, said catalyst being a material capable of dissociating molecular hydrogen to monatomic hydrogen, a plurality of porus matrices in said case, each porus matrix separating one of said positive electrodes and one of said conductive supports of said dual porosity negative electrode, an alkaline electrolyte in the pores of said matrix, a supply of hydrogen in said case surrounding said electrodes and matrix, said case being hermetically sealed to prevent inflow and outflow of gas during charging and discharging of said cell.

3,867,200

METHOD AND APPARATUS FOR MAKING OXIDIZED EXPANDED LEAD BATTERY GRIDS

Elon Daniels, Jr., Frankton, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 20, 1973, Ser. No. 398,976
Int. Cl. H01m *35/04*
U.S. Cl. 136—36 **3 Claims**



1. A method of making lead-acid storage battery plates comprising:

advancing a narrow lead strip having a predetermined thickness, longitudinally between two rows of progressive dies and cutters, said strip having a central, longitudinal lug-forming portion and two expandable grid-forming portions flanking the lug-forming portion and extending to both longitudinal edges of the strip, and said rows com-

prising a plurality of dies and cutters having low drag surfaces and which converge in incremental steps on the central lug-forming portion of the strip passing between them;

while bathing said strip, dies and cutters in water, expanding the grid-forming portions along the longitudinal edges thereof by periodically shearing rectangular wire-like segments from said edges into a plurality of tiers of undulatory skeletal elements extending at acute angles to the plane of said lug-forming portions and such that successive tiers are offset one from the other and joined one to the other by a plurality of nodes which join the ends of successive segments in one tier to the centers of like segments in successive tiers, said nodes having rectangular, vertically transverse cross-sections and widths significantly greater than said predetermined thickness and equal to the sum of the widths of the adjoining skeletal elements, whereby two reticulated portions comprising a plurality of polygonal paste-retaining cells bounded by said skeletal elements and nodes are formed, extend at acute angles from the central portion in gull-wing fashion when viewed head-on, and are surface-oxidized to promote better adhesion with the subsequently applied paste; leveling the thusly expanded strip by folding said reticulated portions down into nearly the same plane as said central portion;

uniformly stretching the reticulated portions in directions substantially perpendicular to the direction the strip is fed through the dies by urging each tier of skeletal elements in those directions independently of the other tiers to uniformly size the cells, stretch the reticulated portions to a predetermined width and slightly rotate the rectangular nodes such that diagonally opposed edges of the nodes become salient in the principal planes of the reticulated portions;

flattening the reticulated portions by further rotating said nodes and compressing said salient edges into plateaus and thereby convert the rectangular cross-sections of said nodes to polygonal cross-sections having two opposing sides thereof laying in planes substantially parallel to the faces of the pasted plate and spaced one from the other by a distance greater than said predetermined thickness but substantially less than twice said predetermined thickness;

substantially engulfing the reticulated portions in a leady active material paste and sandwiching same between strips of paper which are substantially coextensive with said reticulated portions;

drying the paper-bound pasted strip; and

finally segmenting the pasted strip into individual battery plates.

3,867,201

HERMETICALLY SEALED ELECTROLYTE BATTERY AND METHOD OF FILLING WITHOUT BREAKING HERMETIC SEAL

Robert W. Holmes, Boston, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Aug. 11, 1971, Ser. No. 170,888

Int. Cl. H01m *21/10*

U.S. Cl. 136—114 **7 Claims**

1. An organic electrolyte battery, comprising

a metallic can-shaped container;

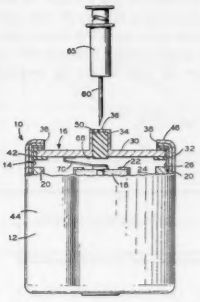
electrode elements of opposite polarities disposed therein;

a fluid organic electrolyte immersing said electrode elements;

a top closure for said container comprising an electrode terminal for said battery, said closure comprising a metallic disc having a central portion shaped in the form of an axially rising hollow concentric boss, the top surface of said boss having a coaxial opening;

means electrically connecting said closure to an electrode element within said container;

and a sealing element supported by said closure and contained within said hollow boss, said sealing element com-



prising a septum plug of rubber-like material penetrable by a needle and self-restoring and self-resealing upon removal of said needle, said sealing element serving as an inlet for said electrolyte during the filling operation, and then serving as an hermetic seal for said container.

3,867,202

CHEMICAL VAPOR DEPOSITION FOR EPITAXIAL GROWTH

Eiichi Ichiki; Kazuo Iida; Masato Ogura, all of Niihama; Yasuo Seki, and Sizuo Asanabe, both of Kawasaki, all of Japan, assignors to Sumitamo Chemical Company, Limited, Osaka and Nippon Electric Company, Limited, Tokyo, both of, Japan

Filed Mar. 13, 1974, Ser. No. 450,682

Claims priority, application Japan, Mar. 15, 1973, 48-30664

Int. Cl. H01i *7/36*

U.S. Cl. 148—175 **13 Claims**

1. In a method for producing an epitaxial layer of a group III*a* – V*a* element compound on surface of a substrate which comprises reacting an alkyl compound of a group III*a* element with a group V*a* element or a volatile compound thereof in vapor phase and contacting the reaction product with the substrate, the improvement which comprises reacting triethylaluminum which contains at most 4 ppm of silicon with a gallium halilde or an indium halide to produce triethylgallium or triethylindium and contacting thus obtained triethylgallium or triethylindium alone, a mixture of them or a mixture of them and an alkyl compound of aluminum with a group V*a* element, a hydride of said element or an alkyl compound of said element.

3,867,203

METHOD FOR PRODUCING SEMICONDUCTOR DEVICES

Horst Gesing; Rigobert Schimmer, and Manfred Streit, all of Belecke, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 25, 1973, Ser. No. 373,274

Claims priority, application Germany, June 23, 1972, 2230749

Int. Cl. H01l *7/44*

U.S. Cl. 148—187 **25 Claims**

1. A method for producing a semiconductor device comprising the steps of:

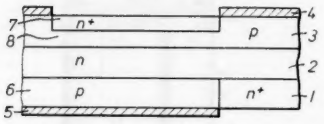
providing a wafer of semiconductor material;

providing first and second diffusible doping substances which have different diffusion speeds and which produce one conductivity type and the opposite conductivity type,

respectively, and with said second doping substance being a substance which inhibits the diffusion of said first doping substance into the material of said wafer;

applying a masking layer which has a different permeability for each of said first and second diffusible doping substances to a portion of the surface of said wafer;

simultaneously forming a region of only said one conductivity type beneath said masking layer and a region of only said opposite conductivity beneath the unmasked portion of the surface of said wafer by exposing said masked



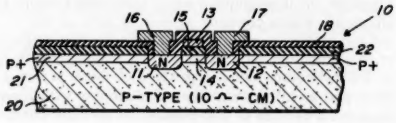
wafer simultaneously to said first and second diffusible doping substances under an elevated temperature and for a time sufficient to diffuse said first doping substances into said wafer through said masking layer, and to diffuse said second doping substance into said wafer at unmasked portions thereof, whereby said masking layer acts as an effective diffusion mask for said second doping substance and said second doping substance serves as a masking substance to inhibit diffusion of said first doping substance into said wafer at said unmasked portions.

3,867,204

MANUFACTURE OF SEMICONDUCTOR DEVICES

James L. Rutledge, Saratoga, Calif., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 19, 1973, Ser. No. 342,926
Int. Cl. H01l 7/34
U.S. Cl. 148—188 **7 Claims**



1. A method of manufacturing an MOS transistor in the surface of a semiconductor substrate comprising the steps of:

providing a semiconductor substrate which is lightly doped with an impurity of a first conductivity type;

coating the entire surface of said substrate with a glass containing a dopant which is of said one conductivity type;

opening at least two windows in said doped glass to define a source and a drain for the MOS transistor;

depositing a dopant of the other conductivity type in said windows; and

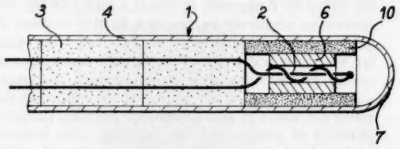
heating the substrate to diffuse dopant of said one conductivity type into the surface of the substrate and the dopant of the other conductivity type in the area underlying the windows.

3,867,205

REFRACTORY METAL HOT-JUNCTION THERMOCOUPLE

Robert Schley, Orly, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 16, 1973, Ser. No. 351,270
Claims priority, application France, Apr. 20, 1972, 72.13896
Int. Cl. H01r 1/04
U.S. Cl. 136—232 **6 Claims**



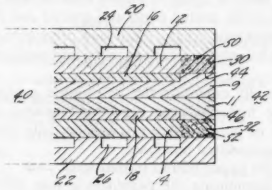
1. A hot-junction thermocouple comprising two conducting wires insulated by ceramic beads and surrounded and protected by a hermetically sealed gas filled metal sheath, one wire being straight and the other wire coiled about and spaced from the straight wire, the wires being connected to their ends and a noble-metal crimping element on the twisted hot junction isolated in the metal sheath.

3,867,206

WET SEAL FOR LIQUID ELECTROLYTE FUEL CELLS

John C. Trocciola, Glastonbury; Craig R. Schroll, West Hartford, and Dan E. Elmore, South Windsor, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 21, 1973, Ser. No. 427,210
Int. Cl. H01m 27/04, 27/02
U.S. Cl. 136—86 D **3 Claims**



1. A fuel cell electrode comprising an electrically-conductive material having a peripheral sealing portion and a central active portion, said active portion including a catalytic surface and being porous to the transmission of gas and substantially hydrophobic, said sealing portion being hydrophilic and having the capability of retaining electrolyte therein through its thickness by capillary action, thereby providing a wet seal capability in said sealing portion.

3,867,207

METHOD OF BLACKENING A STEEL COMPONENT FOR A COLOR CATHODE RAY TUBE

John J. Decker, and Susan V. Zito, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 29, 1973, Ser. No. 364,975
Int. Cl. C23f 5/02
U.S. Cl. 148—6.14 R **4 Claims**

1. A method of blackening a steel component which comprises the steps of: degreasing said component; immersing said component in a 50% hydrochloric acid bath for about 1 minute; rinsing said component in deionized water; immersing said component in an electroless plating bath selected from

the group consisting of nickel or cobalt for about 15 minutes, said plating bath including an effective amount of a reducing agent including a hypophosphite compound; rinsing said component in deionized water; immersing said component in a strong oxidizing acid bath for 30 to 45 seconds; rinsing said component in warm tap water; rerinsing said component in deionized water; rerinsing said component in anhydrol; drying said component; and firing said component in air for about 1 hour at about 450°C.

3,867,208

METHOD FOR PRODUCING ANNULAR FORGINGS

Nikolai Alexandrovich Grekov, Tikhoretsky prospekt, 9, korpus 7, kv. 83; Galina Ivanovna Arkovenko, prospekt Metallistov, 113, kv. 49; Elena Petrovna Silina, ulitsa Shatelena, 8, kv. 66; Natalia Petrovna Shifrina, Varshavskaya ulitsa, 22, kv. 4, all of Leningrad; Tamara Nikolaevna Sazonova, Srednaya Pervomaiskaya ulitsa, 19, kv. 13; Vasily Yakovlevich Kleimenov, Srednaya Pervomaiskaya ulitsa, 12, kv. 10, both of Moscow; Josif Sholomovich Kvater, ulitsa Krasnykh partizan, 3, kv. 5; Moisei Grigorievich Zlatkin, ulitsa Yakova Severdlova, 34, kv. 22; Valdislav Alexandrovich Mirmelshtein, ulitsa Pushkinskaya, 14, kv. 15, and Alexei Ivanovich Potapov, prospekt Crdzhonikidze, 24, kv. 1, Sverdlovsk, all of U.S.S.R.

Continuation of Ser. No. 92,525, Nov. 24, 1970, abandoned. This application May 21, 1973, Ser. No. 362,345

Int. Cl. C21d

U.S. Cl. 148—11.5 R **4 Claims**

1. A method for producing large annular forgings of more than about 500 kg. by freely forging an ingot made of titanium-based alloys with a double-phase $\alpha + \beta$ structure, the amount of β phase being up to 30 percent, which comprises the steps of heating the ingot before successive forging steps, the first heating exceeding by 50°–80°C the temperature of phase transformation from β to $\alpha + \beta$ structure; subjecting said ingot to successive multiple plastic deformations in the axial, radial, and tangential directions of the ingot with an overall degree of deformation being not less than 60 percent to form a blank; decreasing each heating step during said deformation from said first heating temperature to a temperature 20°–30°C below the temperature of said phase transformation before the last mentioned deformation, the temperature of each heating step being between 950° and 1050°C; and annealing the blank on completion of said plastic deformation, the annealing being performed at a temperature somewhat below said temperature of phase transformation whereby a large annular blank having solely a uniform equiaxial microstructure is produced.

3,867,209

METHOD OF TREATING Ti-Nb-Zr-Ta SUPERCONDUCTING ALLOYS

Takefumi Horiuchi, Kobe; Yoshiyiki Monju, Nishinomiya; Isamu Tatara, Kobe; Nobuyuki Nagai, Kobe; Manabu Hisata, Kobe, and Kiyoshi Matsumoto, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe City, Japan

Filed Sept. 17, 1973, Ser. No. 397,866

Int. Cl. C22f *1/18*

U.S. Cl. 148—12.7 **1 Claim**

1. A method of working and treating Ti-Nb-Zr-Ta superconducting alloy consisting of 10–50at%Ti, 20–50at%Nb, 10–40at%Zr and 5–12at%Ta to achieve a fine and non-homogeneous structure which comprises the steps of:

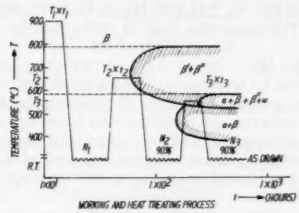
forming a β solid solution of said Ti-Nb-Zr-Ta alloy by heating the alloy to a temperature within the β solid solution range;

cooling and cold working said heated Ti-Nb-Zr-Ta alloy;

heating said cold worked alloy to a temperature within the ($\beta'+\beta''$) phase region and then cooling said heated ($\beta'+\beta''$) alloy to maintain the peritectoid structure;

cold working the peritectoid alloy;

forming a multi-phase $\beta'+\beta''+\alpha$ (ω) eutectoid alloy structure by heating said peritectoid alloy to a temperature



within the ($\beta'+\beta''$ $\beta'+\beta''+\alpha$ ($+\omega$) eutectoid structure range and then cooling said eutectoid alloy; and

cold working the eutectoid alloy.

3,867,210

PROCESS FOR THE PRODUCTION OF MILD STEEL TUBES

Carl Bertil Bengt Lagercrantz, and Carl Johan Staffan Finden, both of Virsbo, Sweden, assignors to Virsbo Bruks AB, Virsbo, Sweden

Continuation of Ser. No. 65,671, Aug. 19, 1970, abandoned. This application Mar. 1, 1973, Ser. No. 337,114

Claims priority, application Sweden, Aug. 25, 1969, 11746/69

Int. Cl. C21d *3/04, 1/74*

U.S. Cl. 148—16 **10 Claims**

1. A process for the production of mild steel tubes comprising:

a. heating steel tubes in the absence of a protective gas in a heating zone containing air to a temperature in the range of from about 640° to about 900°C;

b. supplying wet hydrogen having a dew point of between 30° and 50°C to said heating zone when the temperature range is reached and maintaining the hydrogen supply in that temperature range until a substantial lowering of the carbon and nitrogen content of the tubes and an increase in the grain size of the tubes has been effected; and then

c. cooling the tubes.

3,867,211

LOW-OXYGEN, SILICON-BEARING LAMINATION STEEL

Robert W. Easton, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 16, 1973, Ser. No. 388,732

Int. Cl. C04b *35/00*

U.S. Cl. 148—31.55 **17 Claims**

7. A process of making a fully-processed grade steel of the carbon steel type comprising the steps of providing a carbon steel melt having a carbon content up to 0.1% maximum, reducing the nitrogen content of said melt to 0.008% maximum and reducing the oxygen content of said melt to 0.01% maximum, adding to said melt from about 0.05% to about 1.0% manganese and from about 0.05% to about 0.15% phosphorus and up to 0.6% silicon, casting said steel melt, hot rolling said steel to hot band, pickling said steel, cold rolling said steel to cold band, subjecting said steel to a heat treatment and reducing said carbon content to 0.010% maximum in at least one of said melt, said hot band and said cold band during said process thereby providing said fully-processed grade steel with a 60 hertz core loss of about 4.5 watts per pound at 15 kilogausses at a thickness of 0.025 inch.

3,867,212

COMPOSITE MATERIAL, TUBING MADE FROM THE MATERIAL, AND METHODS FOR MAKING THE MATERIAL AND TUBING

John A. Dromsky, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 235,297, March 16, 1972, Pat. No. 3,775,194. This application Aug. 31, 1973, Ser. No. 393,389

Int. Cl. C22c *41/02*

U.S. Cl. 148—127 4 Claims

1. A method for treating a composite metal laminate material embodying a thin inner layer of austenitic stainless steel sandwiched between and metallurgically bonded to two relatively thicker outer layers of low carbon steel for enhancing formability of said laminate material, said method comprising the steps of heating said laminate material to a temperature in the range from about 1850°F. to about 2050°F. for a period of time in the range from about one-half to two minutes for annealing said stainless steel material and heating said laminate material to a temperature in the range from about 1050°F. to about 1100°F. for a period of at least about three hours for removing carbon from solid solution and for precipitating carbon is said low carbon steel to enhance formability of said laminate material while permitting some intergranular carbide precipitation in said stainless steel layer of said laminate material.

3,867,213

FERROCENE-CONTAINING MONOMERS AND COPOLYMERS

Trevis E. Stevens, and Samuel F. Reed, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 849,254, July 31, 1969,. This application May 18, 1971, Ser. No. 144,280

Int. Cl. C06d *5/06*

U.S. Cl. 149—19.2 2 Claims

1. A propellant composition comprising ammonium perchlorate in an amount from about 50 to about 70 weight percent; aluminum metal in an amount from about 5 to about 20 weight percent; a plasticizer selected from diisooctyl azelate, di-2-ethylhexyl azelate, dipropylene glycol dipelargonate, and isodecyl pelargonate in an amount from about 5 to about 25 weight percent of the propellant composition; and copolymers in an amount from about 5 to about 30 weight percent, said copolymers being formed from butadiene reacted with a polymerizable monomer selected from pentaerythritol metacrylate tris(ferrocenoate) and pentaerythritol acrylate tris(-ferrocenoate), said butadiene and said monomer being reacted in a mole ratio of butadiene to monomer from about 40 to 1 to about 80 to 1 while in the presence of a suitable initiator contained in a suitable organic solvent for a predetermined period of time and at a predetermined temperature to form said copolymers; said suitable initiator being azo-bis-(2-methyl-5-hydroxy-valeronitrile); said suitable organic solvent being toluene; said predetermined period of time being about 72 hours; said predetermined temperature being from about 66°C to about 67°C; said copolymers being characterized by a molecular weight in the range from about 3,500 to about 4,700, OH end groups from about 0.8 to 1.2 weight percent, and Fe content from about 3.9 to about 6.9 weight percent.

3,867,214

NITROCELLULOSE DOUBLEBASE PROPELLANT CONTAINING TERNARY MIXTURE OF NITRATE ESTERS

Jonas Zucker, West Orange; Russell Trask, Morris Plains, both of N.J., and Edward Costa, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 18, 1967, Ser. No. 669,359

Int. Cl. C06b *5/00*

U.S. Cl. 149—100 9 Claims

1. In a double base propellant composition containing nitrocellulose, the improvement consisting of the incorporation in said propellant composition of one of the ternary mixtures of nitrate esters selected from the group consisting of:

Trimethylolethane trinitrate, triethyleneglycol dinitrate and diethyleneglycol dinitrate;

Trimethylolethane trinitrate, triethyleneglycol dinitrate and glycol dinitrate;

Trimethylolethane trinitrate, glycerol monolactate trinitrate and diethyleneglycol dinitrate;

Trimethylolethane trinitrate, glycerol monolactate trinitrate and glycol dinitrate;

Nitroisobutylglycerol trinitrate, glycerol monolactate trinitrate, and diethyleneglycol dinitrate;

Nitroisobutylglycerol trinitrate, glycerol monolactate trinitrate, and glycol dinitrate;

Nitroisobutylglycerol trinitrate, triethyleneglycol dinitrate and diethyleneglycol dinitrate;

Nitroisobutylglycerol trinitrate, triethyleneglycol dinitrate, and glycol dinitrate.

3,867,215

NITROCELLULOSE DOUBLE-BASE PROPELLANT CONTAINING BUTANETRIOLTRINITRATE

Jonas Zucker, West Orange; Russell L. Trask, Morris Plains, both of N.J., and Edward Costa, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1968, Ser. No. 717,487

Int. Cl. C06b *5/00*

U.S. Cl. 149—100 4 Claims

1. In a double based propellant containing nitrocellulose and the mixed nitrate esters of trimethylolethanetrinitrate and triethylene glycol dinitrate, the improvement consisting of the incorporation therein of butanetrioltrinitrate to achieve a propellant having a force of at least 380,000 foot pounds per pound of propellant and an isochoric flame temperature below about 3,350°K.

3,867,216

PROCESS AND MATERIAL FOR MANUFACTURING SEMICONDUCTOR DEVICES

Adir Jacob, 20 Knight Rd., Framingham, Mass. 01701

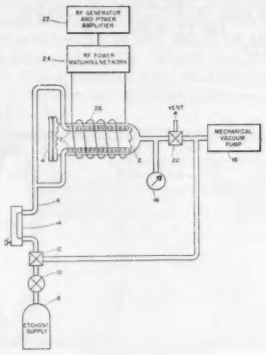
Continuation-in-part of Ser. No. 252,863, May 12, 1972, Pat. No. 3,795,557. This application Nov. 16, 1973, Ser. No. 416,422

Int. Cl. B44c *1/22*; C73f *1/02*

U.S. Cl. 156—2 7 Claims

1. A process for removing organic photoresist material from a substrate in a plasma environment, comprising the step of: exposing the material to a gaseous plasma formed from a binary mixture of oxygen and a halocarbon having no more

than two carbon atoms per molecule, wherein at least one carbon atom in said molecule is linked to a predominance of



fluorine atoms, and wherein oxygen constitutes at least 25% by volume of said binary mixture.

3,867,217

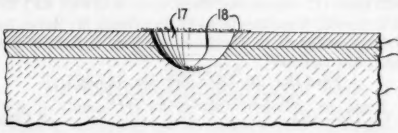
METHODS FOR MAKING ELECTRONIC CIRCUITS

Charles Maggs, Florham Park, and Walter Werner Weick, Somerville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1973, Ser. No. 410,619

Int. Cl. C23f *1/02*

U.S. Cl. 156—3 **10 Claims**



1. In a method for making electronic circuits, the improvement comprising the steps of:

forming a first metal layer on a surface of a substrate;

forming a second metal layer over the first layer, the second layer being of a different metal from that of the first layer;

defining a circuit comprising the step of evaporating with a laser beam a portion of the first and second layers thereby to expose at least one area of the substrate surface;

cleaning the exposed substrate surface area comprising the step of directing a fluid stream containing abrasive particles against the second layer and said area, the fluid stream being sufficiently abrasive to clean the substrate surface area and to erode part of the second layer, but not sufficiently abrasive to penetrate through the second layer;

and selectively dissolving the second layer by exposing it to a metal etchant which does not significantly affect the metal of the first layer.

3,867,218

METHOD OF ETCHING A PATTERN IN A SILICON NITRIDE LAYER

Loic Henry, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 25, 1973, Ser. No. 354,394

Int. Cl. B29c *17/08;* **C09k** *3/00*

U.S. Cl. 156—8 **14 Claims**

1. A method of etching a pattern in a silicon nitride layer provided on a substrate, in particular for use in the manufacture of semiconductor devices in which the substrate contains semiconductor material, said method comprising applying to desired portions of the silicon nitride layer an etching bath which contains hydrofluoric acid, ammonium fluoride, phosphoric acid, and water in quantities in which the bath forms a dilute acid solution with high ammonium fluoride content.

3,867,219

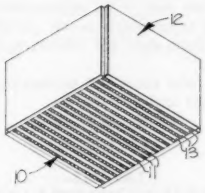
METHOD OF MAKING PILE FABRICS FROM A BLOCK OF PILE MATERIAL

Emanuele Bondi, Milan, Italy, assignor to Fieldcrest Mills, Inc., Eden, N.C.

Continuation-in-part of Ser. No. 316,740, Dec. 20, 1972, Pat. No. 3,831,232, and a continuation-in-part of Ser. No. 363,832, May 25, 1973,. This application Sept. 18, 1973, Ser. No. 398,560

Int. Cl. B32b *5/00, 31/12, 31/18*

U.S. Cl. 156—72 **33 Claims**



1. A method of making pile fabrics, such as carpets, rugs and the like which comprises providing a pile strand block of rows of substantially parallel strands of pile forming material in an open-ended container with the block having dividers of sheet material therein separating adjacent rows of the strands, incrementally feeding from the container the pile strand block parallel to the axes of the pile strands in successive increments of an amount equal to the desired length of pile, treating the ends of the dividers in the block to cause them to foreshorten relative to the adjacent ends of the pile strands so that relatively short lengths of the pile strands are exposed and project beyond the adjacent ends of the dividers, and severing each fed increment of pile strands and the foreshortened dividers transversely of the pile strand axes while bringing the projecting ends of the severed pile strands into contact with a layer of adhesive for securement thereto and to form spaced rows of cut pile tufts thereon.

3,867,220

DECORATION OF CERAMIC WARE

William Gratty, Stoke-on-Trent, England, assignor to William Boulton Limited, Stoke-on-Trent, England

Filed May 24, 1972, Ser. No. 256,229

Claims priority, application Great Britain, May 25, 1971, 16816/71

Int. Cl. B32b *31/20*

U.S. Cl. 156—73.6 **9 Claims**

1. A method for decorating ware comprising applying a transfer or print to a portion of the surface of the ware to be decorated, immersing the ware in a mass of particulate treatment media, and vibrating the ware and media whereby the latter act on the print in a manner effective to transfer the desired design or decoration to the surface of the ware.

3,867,221
PREPARING AN ARTICLE OF THERMOSETTING RESIN

Peter R. Chant, Delft, Netherlands

Filed Apr. 16, 1973, Ser. No. 351,734
Claims priority, application Great Britain, Apr. 19, 1972, 18108/72
Int. Cl. B32b 5/18
U.S. Cl. 156—77 4 Claims

1. In the process of producing an article of thermosetting resin which comprises:

a. impregnating a flexible, compressible sheet having an open-cell foam structure with a curable thermosetting resin,

b. applying a layer of fibrous reinforcing layer to at least one side of the impregnated sheet,

c. compressing the impregnated sheet and reinforcing layer to the extent that resin is expelled from the sheet into the fibrous reinforcing layer to impregnate this layer with resin throughout its thickness, and

d. heating the resin in the sheet and layer to cure while maintaining the compression, the improvement comprising;

e. wherein the heating in (d) is greater in the reinforcing layer and the resin passes through a more advanced state of cure than the resin in the impregnated sheet,

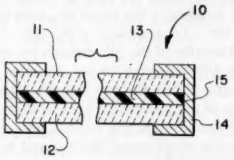
f. reducing the compression on the partially cured resin impregnated foam sheet and reinforcing layer to expand the same, and

g. heating the foam sheet and reinforcing layer to completely cure the resin.

3,867,222
METHOD OF MAKING MULTIPLE LAYER LIGHT TRANSMISSIVE LAMINATES

William J. Plant, Glenshaw, Pa., and John J. Szwarc, Fredonia, Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Dec. 12, 1972, Ser. No. 314,387
Int. Cl. B32b 17/10, 3/02; B29c 27/02; C03c 27/00; H01j 29/06
U.S. Cl. 156—107 4 Claims



1. The method for preparing multiple layer light transmissive laminates resistant to discoloration at elevated temperatures comprising:

applying a coating of light transmissive polymerizable thermosetting resin to the confronting surfaces of at least two light transmissive sheets;

sealing the edges of said sheets to preclude exposure of the said resin to air;

said resin being susceptible to curing on exposure to radiation in the absence of free oxygen;

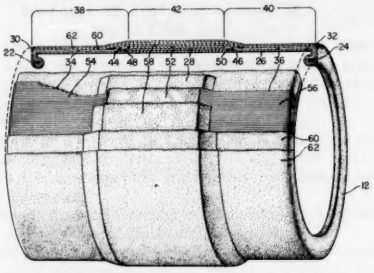
passing radiation energy through one of the said sheets into the said resin until the said resin is cured; and

recovering a cured light transmissive laminate.

3,867,223
METHOD FOR SHAPING PNEUMATIC TIRE

Paul E. Appleby, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 28, 1972, Ser. No. 266,886
Int. Cl. B29h 17/26
U.S. Cl. 156—123 8 Claims

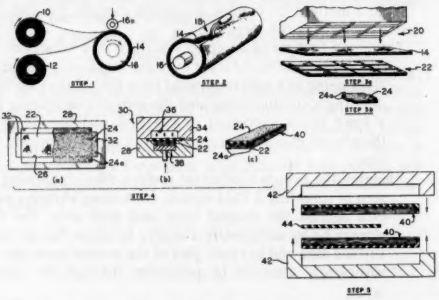


5. In a method of manufacturing a pneumatic tire including the steps of shaping an unvulcanized tire from the generally cylindrical configuration to a general configuration of a torus the improvement comprising; during the expansion of said tire, exerting first tangential forces which are isotropic to the inner surface of a central portion of the tire and applying second tangential forces which are non-isotropic to the inner surfaces of a pair of portions extending circumferentially about the tire and disposed on axially outer sides of said central portion.

3,867,224
METHOD OF MANUFACTURING SCRAPPER BELTS

Fred L. Jacobs, Wapakoneta, and Leroy Nagel, St. Marys, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 26, 1973, Ser. No. 427,885
Int. Cl. B32b 31/02, 31/20
U.S. Cl. 156—182 8 Claims



1. The method of manufacturing belts for scrapper paddles used in dehairing apparatus comprising the steps of:

A. assembling a layup of alternate reinforcing and flexible fabric plies;

B. cutting belt sized units from the fabric layup;

C. providing uncured rubber stock having a square area greater than that of the fabric layup;

D. applying the rubber to one side of the fabric and cold forming the rubber around all edges of the fabric to form one-half of a belt unit;

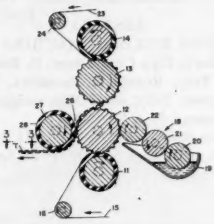
E. inserting two half belt units into a mold in fabric-faced-opposed relation separated by an interlayer of rubber stock; and

F. applying heat and pressure to form an integrally molded belt unit.

3,867,225
METHOD FOR PRODUCING LAMINATED EMBOSSED WEBS

Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Continuation of Ser. No. 24,980, March 19, 1970, abandoned, which is a division of Ser. No. 793,430, Jan. 23, 1969, Pat. No. 3,556,907. This application Apr. 30, 1973, Ser. No. 355,565
Int. Cl. B31f *1/20*
U.S. Cl. 156—209 **2 Claims**

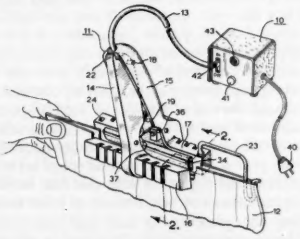


1. A method for producing laminated embossed webs comprising separately embossing two webs each with a pattern of projections of about 10 to about 200 per square inch and a height of about 0.01 to about 0.05 inches, applying adhesive to at least some of the projections of one of said webs while the same is supported on an embossing roll, orienting said webs so that the projections face each other and interlace with each other so as to provide air spacing in the interlacing, and applying a linear laminating pressure by passing said webs through the nip defined by a marrying roll and the embossing roll which provided the projections on said one web to join said webs while said one web has the projections thereon supported and while maintaining the hardness of said marrying roll and the pressure in said nip to prevent distortion of the projections of the other said webs.

3,867,226
METHOD FOR SEALING PLASTIC BAGS

Joseph J. Guido, 351 Forest Rd., Hensdale, Ill. 60521, and James R. Anderson, 130 N. Bassford Ave., La Grange, Ill. 60525

Division of Ser. No. 201,830, Nov. 24, 1971, Pat. No. 3,822,164. This application May 23, 1974, Ser. No. 472,551
Int. Cl. B32b *31/00*
U.S. Cl. 156—229 **1 Claim**



1. A method for sealing the open end of a plastic bag or the like at one or more locations on its rim to provide an integral carrying handle for the bag, the method utilizing a hand-held impulse-sealing tool comprising a head portion having a pair of heating platens operatively connected to come together in a pressure and heat-applying closed position and further having a spacer depending from one of the platens to engage the rim of the bag opening at a predetermined distance from said closed position of said heating platens, comprising the steps of:

grasping the sealer head in one hand;

engaging the spacer with the inside of the rim of the bag opening;

grasping the rim of the bag with the other hand at a location approximately opposite that of the point of engagement of the spacer;

pulling the bag taut between the point of spacer engagement and the point of grasp, thereby drawing opposite sides of the rim together;

positioning the taut sides of the rim between the heating platens;

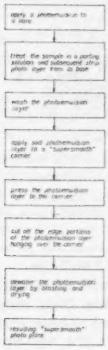
applying pressure to the platens to activate the heating elements and accomplish the seal;

and removing the sealing head and its depending spacer from the now sealed end of the bag.

3,867,227
METHOD FOR PRODUCING SUPER SMOOTH PHOTO PLATES

Franz Klapper, Jena, Germany, assignor to Jenoptik Jena G.m.b.H., Jena, District of Gera, Germany

Filed Jan. 12, 1973, Ser. No. 323,200
Int. Cl. B32b *31/20, 31/18, 31/12*
U.S. Cl. 156—249 **3 Claims**



1. A method for producing a super-smooth photo-plate comprising the steps of

severing the photo-emulsion layer from a carrier after submitting a prefabricated photographic film to an aqueous hydro-fluoric acid bath containing 0.1 to 0.4 volume percent hydro-fluoric acid,

washing the stripped off photo-emulsion layer in distilled water in order to remove impurities and residual hydro-fluoric acid,

subsequent applying said photo-emulsion layer on a clean and very smooth carrier,

said photo-emulsion layer projecting over the edge of said clean and very smooth carrier,

and

cutting off the portions of the photo-emulsion layer projecting over the carrier edge,

removing the residual water from said photo-emulsion layer by means of a pressure-gas stream and finally

drying the resulting very smooth photo-plate at a temperature of about 30°C.

3,867,228
TIRE BUILDING MACHINE

Max D. Brinkley, North Canton, and Robert I. Griffiths, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 12, 1973, Ser. No. 323,030
Int. Cl. B29h *17/02, 17/14*
U.S. Cl. 156—405 **17 Claims**

I. Apparatus for building a giant tire; comprising band building means on which a running length ply is formed to endless cylindrical band form of predetermined circumferential length;

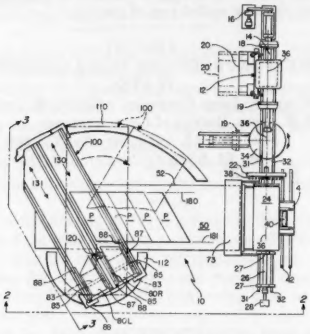
endless belt means for receiving a plurality of successive individual panels of ply stock thereon to form said run-

ning length ply and for transferring directly said ply to said band building means;

bridge means spanning said belt means;

at least one supply roll truck mounted on said bridge means for to and fro movement longitudinally thereof across said belt means;

means for dispensing from a supply roll carried by said truck a single panel of said ply stock during said movement of said truck across said belt means; and



means for advancing said belt means stepwise toward said band building means a distance determined according to the width of said single panel after such panel is received on said belt means whereby successive such panels can be spliced.

3,867,229

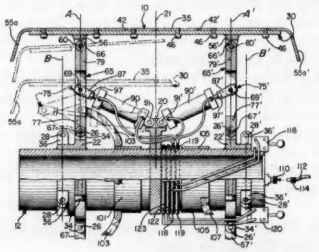
TIRE BUILDING DRUM

Theodore Marra, Barberton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 1, 1974, Ser. No. 438,811

Int. Cl. B29h *17/16, 17/26*

U.S. Cl. 156—417 **10 Claims**



1. A collapsible tire building drum for mounting telescopically on a tire building machine center shaft and for corotation therewith about a common longitudinal axis, comprising a hollow tubular central member slidable longitudinally on said shaft, a pair of spiders each fixed coaxially on the central member and spaced equally axially from a mid-circumferential plane of said drum, each spider accommodating a plurality of pivot pins equiangularly spaced about the central member in two planes perpendicular to said axis, the pins lying in the first such plane being disposed angularly about the axis respectively intermediate the pins lying in the second such plane, a plurality of drum surface support sections cooperable to support a rigid cylindrical building surface extending circumferentially continuously about said central member and longitudinally parallel to said axis, said plurality of sections including at least two major sections and at least two minor sections, a pair of pivot pin lugs secured to each of said support sections each accommodating a pivot pin extending in a plane perpendicular to said axis, a plurality of articulated links each pivotally connected at its radially outer end to one of said lugs and at its radially inner end to one of said spiders, and each such link having between its inner and outer ends an articulating hinge, a plurality of air cylinders, one of said cylinders being connected to each said link to move said hinge and to articulate such link in an axial plane so as to move each respectively associated support section between a drum collapsed and a drum expanded condition.

3,867,230

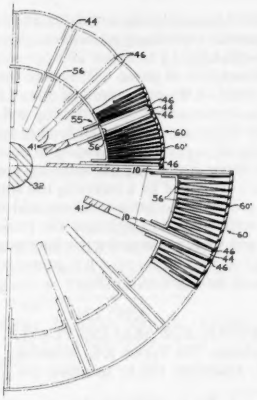
TIRE BUILDING MACHINE

Russell F. Van Horn, Tipp City; Lowell D. Bok, Anna; Albert C. King, Jr., Troy; Ronald R. Suerdieck, Tipp City, and Arthur J. Thrower, Troy, all of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Continuation-in-part of Ser. No. 330,721, Feb. 8, 1973, abandoned. This application Apr. 30, 1974, Ser. No. 465,696

Int. Cl. B29h *12/16, 17/28*

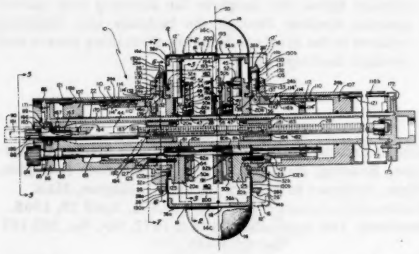
U.S. Cl. 156—417 **20 Claims**



1. A tire shaping and building drum comprising: a base; a shaft supported on said base for rotation about a center line; a sleeve journaled on said shaft for rotation therewith, drive means operatively connected to said shaft and said sleeve for selectively moving one end of said shaft and one end of said sleeve axially toward or away from each other; a first set of circumferentially spaced lever members having one end pivotally mounted on said one end of said shaft; a second set of circumferentially spaced lever members having one end pivotally mounted on said one end of said sleeve; means operatively connected to said shaft and said sleeve for rotating said shaft and said sleeve about a common axis; the other ends of all of said levers having gear sectors, said second set of lever members being in paired axial alignment with said first set of lever members; said gear sectors of said first set of lever members being in meshing engagement with said gear sectors of said second set of lever members; said drive means operatively upon actuation to meshingly engage and rotate said gear sector to raise and lower said other ends of said levers respectively through selective movement of said shaft and said sleeve; each pair of said intermeshing gear sectors having a support member pivotally supported thereby; each pair of circumferentially spaced adjacent support members having a plurality of plate members positioned therebetween, defining a group of plate members; the respective end plate member of each of said group of plate members is secured to the closest adjacent support member; adjacent ones of said plate members of each of said group of plate members being interconnected to adjacent plate members to form an accordian pleated support means which expands radially upon move-

ment of said lever members upwardly and outwardly away from said center line.

3,867,231
TIRE BUILDING MACHINE
William R. Casey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed June 28, 1972, Ser. No. 266,885
Int. Cl. B29h 17/16, 17/26
U.S. Cl. 156—415 28 Claims



5. In tire building apparatus for building a tire having therein a circumferentially inextensible belt;

a building drum comprising an expansible sleeve providing a continuous exterior surface for contiguously supporting said tire and terminating in radially fixed inwardly turned ends;

a hollow continuous cylindrical center shaft disposed coaxially within said sleeve and extending axially outwardly of said ends;

a pair of rigid end bodies mounted coaxially on and corotatably with said shaft for sliding movement toward and away from each other on said shaft, said ends being secured in radially fixed relation respectively to said end bodies;

a plurality of rigid interior support segments, including a first set of greater arcuate width and a second set of lesser arcuate width disposed in alternating sequence circumferentially about each said end body and mounted within said sleeve on each of said bodies for movement radially of the drum rotation axis and cooperable to provide in one condition of said drum firm continuous cylindrical support to said sleeve between said ends;

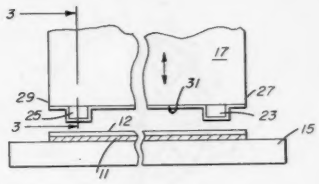
means for moving said segments radially comprising a scroll plate carried by each of said end bodies for coaxial movement respectively therewith and for rotation relative to said end bodies about said axis;

each of said end bodies comprising a plurality of guideways extending radially of the axis, each of said interior support segments having a guide member extending radially of the axis slidable radially in the respectively associated guideway;

groove follower means on each said guide member and cam groove means on each said scroll plate cooperably interengaging to move said segments radially of the axis in response to rotation of said scroll plate; and

means on each said scroll plate comprising an annular groove concentric therewith and a plurality of wheels mounted on each respectively associated end body, said wheels having peripheral rims interengaging said annular groove and cooperable to move said scroll plate axially of the drum together with such end body and to accommodate relative rotation of said scroll plate with respect to said end body.

3,867,232
ULTRASONIC SPLICING APPARATUS
David L. Thompson, West Henrietta, and Everett B. Wardell, LeRoy, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 22, 1972, Ser. No. 255,353
Int. Cl. B31f 5/00; B32b 31/20
U.S. Cl. 156—502 8 Claims



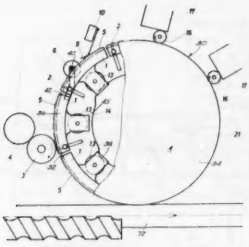
1. An ultrasonic horn for ultrasonically splicing two webs with thermoplastic resin surfaces, said horn having a planar end surface rectangular in shape for engaging a surface of said webs, said rectangular end surface having two parallel long edges and two parallel shorter edges having thereon a pair of spaced bosses positioned so as to extend in a direction parallel to the shorter edges of said rectangular end surface, said spaced parallel bosses projecting a distance of up to about 0.005 inch from said rectangular end surface, said distance being sufficiently small that, when said horn is brought into contact with said webs, ultrasonic splicing occurs over the entire area of said rectangular end surface.

2. Ultrasonic splicing apparatus for splicing two webs with thermoplastic resin surfaces, said apparatus comprising an anvil having a planar surface and an ultrasonic horn having a planar end surface rectangular in shape for engaging a surface of said webs and having two parallel long edges and two parallel shorter edges; said anvil and said horn being relatively movable toward and away from one another into and out of splicing position and said rectangular end surface being adapted to cooperate with the planar surface of said anvil; said horn being oriented with respect to said anvil such that the longer edges of said rectangular end surface lie in a direction parallel to the joint formed by said splicing apparatus; one of either the planar surface of said anvil or the rectangular end surface of said horn having thereon a pair of spaced bosses positioned so as to extend in a direction parallel to the shorter edges of said rectangular end surface or said bosses being located one on each of said surfaces; each of said spaced parallel bosses projecting a distance of up to about 0.005 inch from the surface on which it is located; said distance being sufficiently small that, when said horn is brought into contact with said webs, ultrasonic splicing occurs over the entire area of said rectangular end surface.

3,867,233
LABELING MACHINE WITH RETRACTABLE LABEL SUPPORTS
Erich Eder, Neutraubling, and Josef Brey, Strucken, both of Germany, assignors to Herman Kronseder, Berliner, Germany
Continuation of Ser. No. 872,686, Oct. 30, 1969, abandoned. This application Jan. 21, 1972, Ser. No. 219,904
Claims priority, application Germany, Oct. 30, 1968, 1806037
Int. Cl. B65c 9/20, 9/22
U.S. Cl. 156—571 11 Claims

1. In a labeling machine which includes a rotatable label turret, a label magazine for supplying labels to the turret, and a glue applicator roller located adjacent the periphery of said turret, the improvement comprising a plurality of label sup-

ports around the peripnery of said turret, means for mounting said label supports on said turret for radial movement with respect to the axis of said turret, means for radially moving said label supports between extended and retracted positions, said means for radially moving said label supports including rollers on each of said label supports, a fixed cam surface and springs biasing said rollers against said cam surface, said cam surface being contoured adjacent said glue applicator roller,



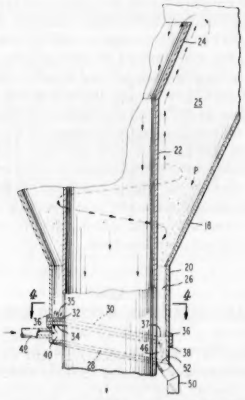
and means operable in response to the absence of a label on said label supports to afford inward movement of said label supports to the retracted position to provide clearance between said label supports and said glue applicator roller, and operable in response to the presence of a label on said label supports to lock label supports carrying labels against movement to the retracted position when said label support is adjacent said relieved cam surface.

3,867,234

SPRAY DRYER CHAMBER COLLECTION SYSTEM EMBODYING A FLUIDIZED BED

Dexter A. Smith, Pittstown, N.J., and Richard Lang, Kent, England, assignors to Bowen Engineering, Inc., North Branch, N.J.

Filed Dec. 27, 1972, Ser. No. 318,779
Int. Cl. B01d *1/16*
U.S. Cl. 159—4 D **15 Claims**



1. In a spray drier of the type that includes a drying chamber having a lower, inverted-frusto-conical product outlet portion, means for introducing dissolved or suspended solids into the chamber in a carrier liquid, means within the chamber for atomizing said liquid, and means for introducing a first gaseous drying medium into the upper part of the chamber for drying the atomized solids-containing liquid to provide dried solids, the improvement comprising:

a. exhaust means for said first gaseous medium extending axially of said product outlet portion, said exhaust means having its inlet intermediate the ends of the outlet portion;

b. a bedplate pervious to the passage of a second gaseous medium introduced for fluidizing said dried solids, said bedplate providing a declining path for flow of the dried solids therealong, said bedplate extending about said gaseous exhaust means at the lower end of the chamber and having along said path a low point, said bedplate having at said low point a product discharge outlet through which to discharge said dried solids from the chamber; and

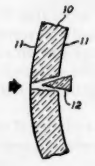
c. said perforate bedplate providing means including a plenum below the bedplate for directing said second gaseous medium through the bedplate into fluidizing relation to the dried solids in flow therealong toward said product discharge outlet.

3,867,235

OPTICAL VIEWPOINT

Hollis E. French, North Chelmsford, Mass.; Stanley C. Herbine, Reading, Pa., and Gerald L. McLeod, Lexington, Mass., assignors to Itek Corporation, Lexington, Mass.

Continuation-in-part of Ser. No. 724,832, April 29, 1968, abandoned. This application Nov. 2, 1972, Ser. No. 303,169
Int. Cl. B44f *1/00*
U.S. Cl. 161—2 **10 Claims**



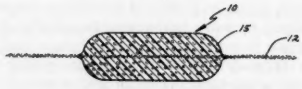
1. An optical viewport consisting essentially of an optically clear, relatively brittle, glass layer which is susceptible to fragmentation upon the receipt of a substantial impact force at its outer surface and an optically clear, flexible, tough polymeric film sufficient to prevent rearward projection of glass fragments upon fragmentation of said brittle layer, said film being bonded to the inner surface of said brittle layer by a bond weak enough to cause partial delamination of the film from the brittle layer when said brittle layer receives an impact force sufficient to cause fragmentation thereof, such delamination helping to dissipate impact force.

3,867,236

BUOYANT PELLETED MATERIAL AND METHOD

Maurice H. O'Link, St. Cloud, Minn., assignor to Stearns Manufacturing Company, Sauk Rapids, Minn.

Filed July 13, 1973, Ser. No. 379,122
Int. Cl. A41d *13/00*; B32b *3/00, 5/18*
U.S. Cl. 161—145 **1 Claim**



1. A buoyant pelleted sheet material, having in combination a sheet of fabric,

a buoyant pellet underlying said fabric,

a buoyant pellet overlying said fabric in register with said underlying pellet, and

said pellets being integrally joined together through said fabric.

3,867,237

PEAR TREE DECORATION

Patricia A. Kearney, R.R. No. 1, Box 13, Bradley, S. Dak. 57217

Filed Dec. 1, 1972, Ser. No. 311,144

Int. Cl. A47g *33/06*

U.S. Cl. 161—24 **1 Claim**

1. An artificial topless pear tree, said tree comprising a flat base, an upright pole mounted into said base and projecting vertically upward, a relatively broad branchlike platform at the top of the tree, said platform comprising at least three elongated branch poles each having its inner ends detachably engaging the top of the pole and projecting radially outward with each one having portions at least slightly inclined upward from horizontal to form a flat branch-like platform at the top of the pole, so that a relatively flat topless tree is formed at the upper end of the tree, an artificial partridge resting centrally on the topless branch-like platform at the top of the tree, a plurality of branch poles beneath said top branch poles projecting radially outward, at spaced intervals toward the bottom of the tree, and progressively larger, in relation to one another, in a direction toward the bottom of the tree.

3,867,238

FLEXILE CORE MATERIAL FOR LAMINATED STRUCTURES AND METHOD OF PRODUCING THE SAME

Thomas J. Johannsen, Toronto, Ontario, Canada, assignor to Chemacryl Plastics Limited, Toronto, Ontario, Canada

Filed Mar. 6, 1973, Ser. No. 338,538

Claims priority, application Canada, Apr. 18, 1972, 140061

Int. Cl. B32b *3/16*

U.S. Cl. 161—37 **13 Claims**

1. A flexile core material for laminated structures comprising a sheet of rigid elastic foam plastic material, said sheet being provided with a plurality of intersecting, rectilinear, slots defining an array of contiguous discrete, polygonal blocklike elements, each element being articulately connected to its adjacent elements by hingepieces constituted by unslotted portions of said material, each slot extending for the full thickness of the sheet save at regularly spaced locations at which it extends for less than the full thickness to define said unslotted portions.

3,867,239

BODY ARMOR CONSTRUCTION

Anthony L. Alesi, Wayland; Verne E. Stimpert, Abington, and Roger A. Gagne, Natick, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 11, 1973, Ser. No. 368,905

Int. Cl. B32b *3/16*

U.S. Cl. 161—37 **5 Claims**

1. A flexible personnel armor material adapted to be compatible with the contours of a human body, said armor material comprising:

a flexible membrane material;

an array of platelets overlaying said membrane, said platelets having a stepped joint configuration so that the platelets lay in substantially one plane while the joints overlap each other, and;

means affixing said platelets to said flexible membrane.

3,867,240

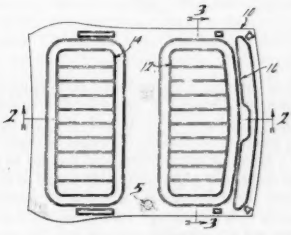
DECORATIVE RESILIENT LAMINAR PANEL

Ralph G. Doerfling, Walled Lake, Mich., assignor to Detroit Gasket & Manufacturing Company, Detroit, Mich.

Continuation-in-part of Ser. No. 255,524, May 22, 1972, abandoned. This application Mar. 26, 1973, Ser. No. 344,629

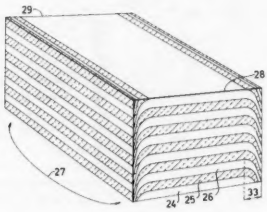
Int. Cl. G10k *11/04*; **E04b** *1/99*; **B32b** *3/26*

U.S. Cl. 161—41 **10 Claims**



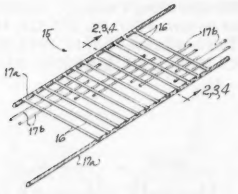
1. A trim panel comprising a resilient laminar panel of a preselected shape-retaining contour including a thermoplastic resin foam core, a cover sheet overlying each face surface of said foam core and bonded thereto over substantially the entire surface thereof, each said cover sheet and said foam core formed with a plurality of perforations extending therethrough from one face to the opposite face of said panel and distributed at spaced intervals over substantially the entire area of said panel, said foam core being of a greater density in the region adjacent to said perforations therethrough than in the region spaced from said perforations, a sealer coating overlying substantially the entire exterior surfaces of the cover sheets and the inner surfaces of said perforations, and a pervious decorative coating extending over substantially the entire face surface of one of said cover sheets and secured thereto.

3,867,241
LAMINAR DISC OF MINERAL WOOL
Ulf Karl Henrik Haglund, Skovde, Sweden, assignor to Rockwool Aktiebolaget, Skovde, Sweden
Filed Apr. 23, 1973, Ser. No. 353,535
Claims priority, application Sweden, Apr. 24, 1972, 5381/72
Int. Cl. B32b 3/04, 19/02
U.S. Cl. 161—42 7 Claims



7. An article according to claim 5, in which the wave length of the laminated product is at least equal to the amplitude up to four-fold the amplitude.

3,867,242
SIMULATED WOVEN FABRICS
Samuel E. Miller, Winnetka, Ill., assignor to Quick Service Textiles, Inc., Chicago, Ill.
Filed Dec. 26, 1973, Ser. No. 428,324
Int. Cl. B32b 5/12
U.S. Cl. 161—57 17 Claims

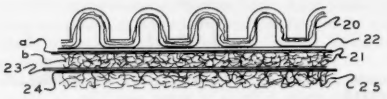


1. In a fabric simulating woven fabric comprising a plurality of parallel threads disposed in one direction to constitute a warp including a selvage warp thread at each edge of the fabric and a plurality of parallel filaments of plastic material disposed in a direction intersecting said threads to constitute a filling, said respective pluralities being joined at their points of intersection, the improvement wherein the juncture of the filling filaments with the selvage warp threads are constituted as a butt joint and are smoothly merged into the selvage warp threads whereby the selvages are substantially free of irregularities.

3,867,243
LAMINATE STRUCTURE SUITABLE FOR CARPET USE AND METHOD OF MAKING
Frederick L. Stoller, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 100,702, Dec. 22, 1970, Pat. No. 3,733,226. This application Feb. 9, 1973, Ser. No. 330,905
Int. Cl. B32b 5/00
U.S. Cl. 161—65 13 Claims

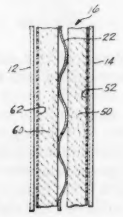
1. A structure composed of a facing yarn and a heat sealable, non-woven fabric heat sealed on at least one surface thereof, the facing yarn being fixed onto said surface of the non-woven fabric.

12. A structure according to claim 1 suitable for non-slip carpeting use composed of non-woven thermoplastic fabric



heat sealed on at least one surface thereof, the facing yarn being fixed onto said heat sealed surface under adhesion producing conditions.

3,867,244
INSULATION AND CONDENSATION CONTROL BLANKET
Clarence R. Adams, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.
Division of Ser. No. 210,882, Dec. 22, 1971, Pat. No. 3,740,905. This application Feb. 5, 1973, Ser. No. 329,769
Int. Cl. B32b 3/28
U.S. Cl. 161—133 4 Claims

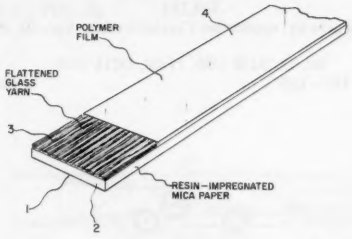


1. An insulation blanket for use within a climate controlled chamber having cold exterior walls; said blanket having a sandwich construction comprising: a corrugated metallic foil member centrally located between an inner layer and an outer layer of insulating material and oriented such that the corrugations extend from one end to an opposite end of said blanket; said inner layer of insulating material comprising a non-wicking glass fiber mat having relatively flat sides with one side pressed against raised portions of the corrugations of said foil member to thereby cooperate with the valleys of said corrugations to form open passageways extending from one end to the opposite end of said blanket; said inner layer of insulating material being capped with a water permeable cover; each of said inner and outer layers having predetermined thicknesses to provide means to normally maintain the temperature of said metallic foil member within a range suitable for condensation of water vapors and draining of condensate out of said blanket along said open passageways and wherein said outer layer of insulating material comprises a closed cell foam adhering to the foil member, and said water permeable cover on said inner layer of insulating material includes a reflective coating for minimizing radiant heat losses.

3,867,245
ELECTRICAL INSULATION

Clairmont J. Herman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 12, 1972, Ser. No. 262,113
Int. Cl. B32b *3/18, 19/06*
U.S. Cl. 161—143 4 Claims



1. Electrical insulating tape having a layer of resin impregnated micaceous paper, superimposed thereon a plurality of flattened glass yarns disposed in spaced, generally lengthwise parallel fashion and superimposed thereon a layer of polymer film.

3,867,246
CHLORINE-FREE MULTIPLE STEP BLEACHING OF CELLULOSE

Gerhard Hebbel, Traisa, and Horst Kruger, Darmstadt, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Apr. 16, 1973, Ser. No. 351,783
Claims priority, application Germany, Apr. 21, 1972, 2219505
Int. Cl. D21c *1/04, 3/04, 9/16*
U.S. Cl. 162—76 20 Claims

1. A plural step process for the chlorine free bleaching of cellulose in an aqueous medium comprising bleaching in a first step with a peroxide or hydroperoxide under alkaline conditions wherein the pH is 8–13, then in a second step with a percarboxylic acid or water soluble salt thereof under acid conditions wherein the pH is 4.5–6.5 and then in a third step again with a peroxide or hydroperoxide under alkaline conditions wherein the pH is 8–13.

3,867,247
ADHESIVE CEMENTS CONTAINING A SULFONATED DERIVATIVE OF BUTYL RUBBER AND LAMINATES THEREFROM

Charles P. O'Farrell, Clark, and John J. Higgins, Westfield, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 17, 1971, Ser. No. 209,414
Int. Cl. C08d *9/16*
U.S. Cl. 161—88 13 Claims

1. A laminate containing at least two substrates bonded together with an adhesive elastomeric solvent based cement of a sulfonated derivative of a butyl rubber having a viscosity average molecular weight of about 100,000 to about 450,000 containing between about 0.1 and about 5.0 mol % of sulfo groups, and as a tackifier, between about 5 and about 90 parts by weight of at least one organo thermoplastic resin having a sotening or melting point above 50°C per 100 parts by weight of elastomers wherein said substrates are independently selected from the group consisting of porous and non-porous materials, wherein said non-porous materials are independently selected from the group consisting of strips or sheetings of polystyrene, polyurethane, cellophane, polypropylene, polyethylene, Mylar, cellulose acetate and metals.

3,867,248
COMPACTED COMPOSITE FABRICS USING THERMOPLASTIC ADHESIVES

Jackson Bauer, Croydon, Pa., assignor to Collins and Aikman Corporation, New York, N.Y.

Division of Ser. No. 863,966, Oct., 1969, Pat. No. 3,666,595.
This application Feb. 24, 1972, Ser. No. 229,194
Int. Cl. B32b *15/02*
U.S. Cl. 161—88 4 Claims

1. The composite textile fabric dimensionally stabilized against shrinkage comprised of a plurality of plies, at least one of which is a textile fabric, and wherein said plies are in the form of relatively flexible and compactable continuous sheets, said plies being compacted into a mating curved fan folded configuration with adjacent plies being bonded together at their interface with a hot melt adhesive, said adhesive being substantially disposed between said plies and becoming flowable above 160°F. and below the softening temperature of said plies, said hot melt adhesive in its flowable state forming a viscous bond between said plies of sufficient strength to prevent delamination of the plies during compaction and wherein the hot melt adhesive in its flowable state configures to the mating curved fan folded configuration of said plies.

3,867,249
PLASTIC COOKING FILM

Peter T. Vitale, Clifton, and Leonel M. Paixao, Trenton, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,611
Int. Cl. B32b *3/30*
U.S. Cl. 161—116 5 Claims

1. A wrapping material for surrounding a food article during oven cooking said wrapping material comprising a plastic, heat resistant, film material having a thickness from about 0.25 to about 1.0 mil, means for maintaining said film material in close proximity to said food article, said film material having an inner surface and an outer surface, said inner surface including a pattern of irregularities having a density from about 100 to 1,000 per square inch and including rounded projections extending from said inner surface from about 20 to about 100 mils whereby said wrapping material is resistant to bumping when a liquid oil-water component is present in a ratio of oil to water of from about 1:4 to 40:1.

3,867,250
STRAW MATS FOR SOIL EROSION CONTROL

Erwin M. Jankowiak, Sanford, and Gerald H. Brandt, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 19, 1973, Ser. No. 417,310
Int. Cl. C08f *45/18*
U.S. Cl. 161—271 8 Claims

1. A coherent air and moisture permeable straw mat for covering soil to prevent wind and rain erosion thereof, said mat comprising straw stalks distributed randomly into a layer with the stalks adhered together at their points of contact with each other with at least 75 pounds per ton of straw of a water resistant adhesive consisting essentially of (1) an interpolymer of less than 60 weight percent of an alkenyl aromatic monomer, wherein an alkenyl group is attached directly to an aromatic nucleus, at least 40 weight percent of an open chain

conjugated diolefin having from 4 to about 9 carbon atoms, and an unsaturated carboxylic acid or anhydride, (2) from about 0.5 to 2.5 weight percent based on polymer solids of a water soluble cellulose ether and (3) from about 0.7 to 2.5 weight percent of a water-soluble organo sulfonate having at least one sulfonate group attached to an aromatic ring and represented by the formula:

$$R—[Ar\ SO_3]\ M$$

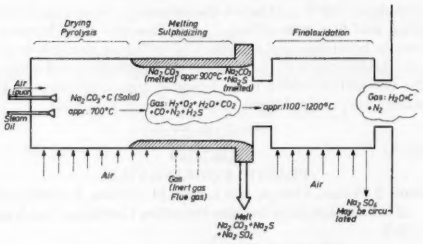
wherein R is an alkyl chain having from about 8 to 20 carbon atoms and combinations of said chains with ethoxy chains, phenyl, phenoxy and alkyl or alkoxy substituted phenyl or phenoxy: Ar is phenyl or naphthyl and M is an alkali metal or ammonia.

3,867,251

COMBUSTION OF ALKALINE COOKING LIQUOR

Gunnar K. Holme, Djursholm, Sweden, assignor to Angpanneforeningen, Stockholm, Sweden

Filed Mar. 26, 1973, Ser. No. 344,652
Claims priority, application Sweden, Apr. 4, 1972, 4304/72
Int. Cl. D21c *11/12*
U.S. Cl. 162—30 **12 Claims**



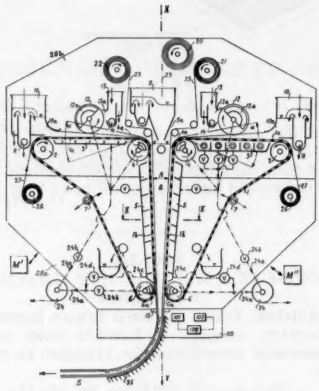
1. A method of treating evaporated alkaline cooking liquor obtained from pulp production in order to recover alkali carbonate and alkali sulphide, comprising introducing a plurality of streams of hot oxygen-containing gas tangentially into a cylindrical reaction chamber to obtain a first area of tangential gas supply extending substantially from one end of said chamber in the axial direction thereof, injecting evaporated liquor of the aforesaid type into said end of the chamber and into contact with said tangential gas supply, controlling the reaction conditions within said first area to obtain a temperature level in a first zone sufficient to dry and pyrolize the injected liquor into alkali carbonate and carbon, and also causing the formation of combustion gas containing the sulphur in the injected liquor in the form of H_2S, controlling the reaction conditions in a second zone following said first zone in the axial direction of the cylindrical chamber to obtain in said second zone a temperature level sufficient to smelt said alkali carbonate and cause a sulphidizing reaction so that a smelt containing alkali carbonate and alkali sulphide is obtained which is removed by tapping from said second zone, introducing a plurality of streams of hot oxygen-containing gas tangentially into said cylindrical chamber to obtain a second area of tangential gas supply extending substantially from said second zone in the axial direction of said chamber, controlling the reaction conditions within said second area to obtain a temperature level in at least one additional zone therein sufficient to oxidize the combustion gases from the preceding zones.

3,867,252

TWIN-WIRE MULTI-PLY PAPER MAKING MACHINE

Michal Skrabak, 5 Urbankova; Ernest Vavrik, 35 Budovatelska; Juraj Jadubik, 77 Olbrachtova, and Stanislav Kolarik, 6 Fucikova, all of Bratislava, Czechoslovakia

Division of Ser. No. 164,060, July 19, 1971, abandoned, which is a division of Ser. No. 858,899, Nov. 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 630,605, April 13, 1967, abandoned. This application June 12, 1973, Ser. No. 369,252
Claims priority, application Czechoslovakia, Apr. 20, 1966, 2632-66
Int. Cl. D21f *1/00, 11/04;* **D21h** *1/08*
U.S. Cl. 162—268 **8 Claims**

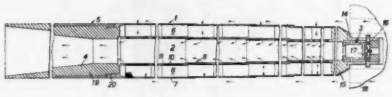


1. Apparatus for making paper products composed of multiple interfelted fibrous plies, comprising a pair of travelling forming wires; means supporting each of said forming wires to provide a substantially horizontal run followed by a downwardly inclined run, said downwardly inclined runs of said forming wires being juxtaposed and defining between themselves a downwardly converging narrow gap; means depositing stock on each of said horizontal runs for forming thereon respective first fibrous plies of deposited fibers which travel to the respective inclined runs; travelling forming means for forming from fibrous stock a pair of second fibrous plies each having a first side facing said travelling forming means, and for depositing each of said second plies on one of said horizontal runs so that the second side faces the first ply on the respective horizontal run; means for depositing fibrous stock on said travelling forming means for forming thereon said second fibrous plies which are deposited on said horizontal runs and travel to the respective inclined runs, so that said first sides become juxtaposed in said gap; headbox means for admitting into said gap and between the formed second fibrous plies a fibrous dispersion in a liquid phase; and means for withdrawing the liquid phase of said fibrous dispersion from said gap through the respective formed first and second fibrous plies so that the deposited fibers of said plies are first released again due to the filtration of the liquid phase through said first and second fibrous plies, and thereupon become interfelted with the fibers of said dispersion which are retained within said gap and form between said second fibrous plies an additional ply which is interfelted with and bonds said first and second fibrous plies together.

3,867,253
NUCLEAR REACTORS

Charles Peter Gratton, Dorchester; Alan Thomas Hoper, Weymouth, and Alan Kenward, Dorchester, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 796,988, Feb. 6, 1968, abandoned. This application Oct. 6, 1971, Ser. No. 187,182
Int. Cl. G21c *3/04*
U.S. Cl. 176—40 5 Claims

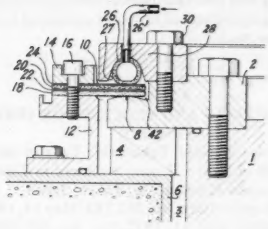


1. A gas cooled fast nuclear reactor having a pair of generally parallel first and second grid plates, a plurality of elongated tubular coolant permeable fuel assemblies extending between said grid plates from one to the other, the sides of the grid plates facing away from each other defining inlet and outlet areas, each assembly including, inner and outer generally parallel perforated tubular elements and a porous fuel bed of fission product retaining fuel particles contained between the tubular elements along a major part of the length of the assembly, an elongated coolant outlet face formed by the bore wall of the inner tubular element of the tubular assembly, an elongated coolant inlet face formed by the outer wall of the outer tubular wall of the tubular assembly; elongated coolant supply channels adjacent and bounded in part by said inlet faces and extending along the length of said inlet faces, the supply channels including means for constraining all of the gas entering the supply channel to flow through the fuel bed, means for introducing coolant to the supply channels from the inlet area through said first grid, said supply channels thus defining a coolant flow path for coolant entering the supply channels to flow in series along the inlet faces and in parallel flow relation into and through the porous fuel beds and through the outlet faces, elongated coolant delivery channels adjacent and formed in part by said outlet faces and extending along the length of said outlet faces to receive gas from said coolant flow path, the delivery channels including means for contraining all of the gas entering the delivery channels through the fuel bed to flow outwardly through discharge oepnings, the coolant delivery channels terminating at said discharge openings which open into the outlet area beyond the said second grid, said delivery channels thus defining a path for the coolant to flow along the outlet faces to said discharge openings, the flow area of the delivery channels into the outlet area being substantially as large as the flow area of the delivery channels at the downstream end thereof, the increasing size of the coolant delivery channels from the upstream end thereof to the discharge opening constituting a means for decreasing the velocity of the coolant and hence increasing the pressure of the coolant along the length of the coolant delivery channels in the flow direction, and thus reducing the difference in the pressure drop across the porous fuel bed along the length of the elongated fuel assembly.

3,867,254
DEVICE FOR SEALING A ROTATING PLUG IN A NUCLEAR REACTOR

Robert Brandstetter, Meschers, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 234,013, March 13, 1972, abandoned. This application Sept. 11, 1973, Ser. No. 396,178
Claims priority, application France, Mar. 17, 1971, 71.09254
Int. Cl. G21c *19/00*
U.S. Cl. 176—87 4 Claims



1. A device for sealing a nuclear reactor plug rotating in a stationary bearing and secured to a ring disposed above the stationary bearing and resting on an annular track positioned on the bearing comprising a second annular friction track on the entire periphery of the top part of the ring, an annular base coaxial with the plug and secured in sealing-tight manner to the stationary bearing around the ring and the track, an annular seal mounted on the annular base and bearing on the friction track of the ring, said seal comprising at least one friction ring, an annular spring ring above and engaging said friction ring, a resilient annular ring above and engaging said spring ring and an annular clamping spring ring above and engaging said resilient ring, and retractable means for clamping said seal against said friction track mounted above said seal and disposed in a second ring secured to said first ring.

JAW

3,867,255
PROCESS OF MAKING YEAST PROTEIN ISOLATE HAVING REDUCED NUCLEIC ACID CONTENT

Jon Albert Newell, Webster Groves; Robert Dudley Seeley, Crestwood, and Ernest Aleck Robbins, High Ridge, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov. 29, 1972, Ser. No. 310,468
Int. Cl. A23j *1/18;* A23l *1/28*
U.S. Cl. 195—5 17 Claims

1. A process for producing a yeast protein product comprising the steps of:

a. Rupturing yeast cells,
b. Separating a solubles fraction containing nucleic acid and protein from an insoluble cell wall debris fraction,
c. Adding nuclease to the solubles fraction,
d. Hydrolyzing the nucleic acid with the added nuclease at a pH of about 5 to about 10 and a temperature of about 30° to about 60°C. for up to four hours, and
e. Separating an insoluble fraction containing said protein from a soluble fraction containing said nucleic acid.

3,867,256

METHOD FOR PRODUCTION OF ALPHA-GALACTOSIDASE BY MICROORGANISM

Shigeyoshi Narita, Kitami; Hirosuke Naganishi, Hiroshima; Chikashi Izumi; Akiyoshi Yokouchi, both of Kitami, and Masaru Yamada, Tokyo, all of Japan, assignors to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,536
Int. Cl. C12d *13/10*
U.S. Cl. 195—11 2 Claims

2. A method for the hydrolysis of raffinose contained in beet molasses or beet juice, which comprises culturing the mold of *Circinella muscae* (Berlese et de Toni) nova typica coreanus (ATCC 20394) in a medium containing substances capable of inducing α-galactosidase, adding the mold containing the α-galactosidase thus produced to beet molasses or beet juice, and maintaining said beet molasses or beet juice under conditions permitting hydrolysis of raffinose contained in said beet molasses or beet juice.

3,867,257

BLEOMYCINIC ACID AND PROCESS FOR PREPARING THEREOF

Hamao Umezawa; Yasushi Takahashi; Tadashi Shirai, and Akio Fujii, all of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation-in-part of Ser. No. 252,252, May 11, 1972,. This application Sept. 21, 1972, Ser. No. 290,986
Claims priority, application Japan, May 15, 1971, 46-32232
Int. Cl. C12d *9/00*
U.S. Cl. 195—81 6 Claims

1. A process for preparing a bleomycin which comprises hydrolyzing bleomycin in the presence of a strain of a Fusarium genus or Helminthosporium genus enzyme system and then reacting with an amine.

3,867,258

LACTATE DEHYDROGENASE TEST MATERIAL

Peter Salvatore Forgione, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 8, 1973, Ser. No. 414,034
Int. Cl. G01n *31/14, 33/16*
U.S. Cl. 195—99 14 Claims

1. A diagnostic test indicator for the determination of the concentration of lactate dehydrogenase in sera comprising a bibulous material having diaphorase covalently bound to a hydrophilic, cross-linked, sulfited aldehyde or ketone polymer dispersed throughout the interstices thereof which contains therein the dried residue resulting from the impregnation thereof with

1. an alkali lactate salt,
2. nicotinamide-adenine-dinucleotide and
3. a tetrazolium salt.

3,867,259

LACTATE DEHYDROGENASE TEST MATERIAL

Peter Salvatore Forgione, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 8, 1973, Ser. No. 414,035
Int. Cl. G01n *31/14, 33/10*
U.S. Cl. 195—99 17 Claims

1. A diagnostic test indicator for the determination of the concentration of lactate dehydrogenase in sera comprising a bibulous material which contains therein the dried residue resulting from the impregnation thereof with

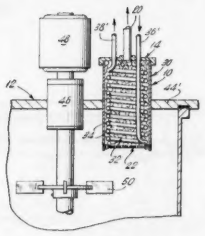
1. a tetrazolium salt,
2. a chromatographic effect preventor,
3. an anti-oxidant,
4. diaphorase and
5. a nicotinamide-adenine-dinucleotide-alkali lactate salt mixture.

3,867,260

MASS TRANSFER CONDENSER, PARTICULARLY FOR USE WITH FERMENTING VESSELS

David Freedman, and Richardo Sadir, both of Highland Park, N.J., assignors to New Brunswick Scientific Co., Inc., New Brunswick, N.J.

Continuation of Ser. No. 827,280, May 23, 1969, abandoned.
This application Mar. 13, 1972, Ser. No. 234,273
Int. Cl. B01d *3/00*; F28b
U.S. Cl. 202—185 E 1 Claim



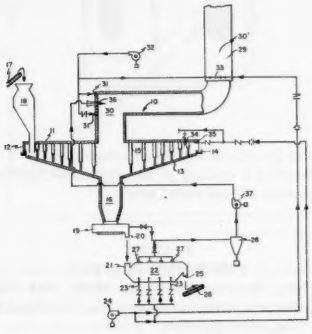
1. In a condenser, upper wall means for discharging out of an enclosure defined in part by said upper wall means for the gaseous phase of a moisture-carrying gas, lower wall means situated beneath and spaced from said upper wall means for admitting the moisture-carrying gas into said enclosure and for discharging the liquid phase of the moisture-carrying gas out of said enclosure, said lower wall means also defining part of said enclosure, uninsulated side wall means extending between said upper and lower wall means and surrounding said enclosure to define the latter together with said upper and lower wall means, tubular means situated within said enclosure for conducting a coolant along a predetermined path in said enclosure, said tubular means being in the form of a coil situated within said enclosure, spaced inwardly from said side wall means thereof, and extending substantially throughout the entire depth between said upper and lower wall means, said upper and lower wall means forming a pair of end wall means through at least one of which said tubular means extends into said enclosure while remaining entirely out of engagement with said side wall means, and mass transfer means packed in said enclosure around said tubular means and in engagement with all of said wall means, said tubular means extending through only one of said end wall means, and said tubular means including elongated supply and discharge portions extending through said one end wall means into said enclosure and respectively communicating with opposite ends of said coil, said supply portion of said tubular means extending along the interior of said enclosure from said one end wall means to the region of the other of said end wall means before communicating with one end of said coil while said discharge portion of said tubular means extends through only a relatively short distance beyond said one end wall means into said enclosure into communication with an adjoining end of said coil, so that coolant will first flow through substantially the entire depth of said enclosure along said supply portion of said tubular means before reaching one end of said coil and will then return along said coil toward said one end wall means before reaching said discharge portion of said tubular means, a fermenting vessel having a top wall formed with an opening through which said side wall means extends with said top wall being situated between said upper and lower wall means so that said lower wall means is situated within said fermenting vessel to receive directly therefrom a moisture-carrying gas from which liquid is to be condensed, whereby the condensed liquid will flow through said lower wall means directly back into said fermenting vessel.

3,867,261

FUEL INCINERATION SYSTEM FOR CALCINER

William E. Solano, Monroeville, Pa., assignor to Salem Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1973, Ser. No. 387,474
Int. Cl. C10b *27/04, 1/10, 21/00*
U.S. Cl. 202—263 14 Claims



1. A fuel incineration system for a calciner comprising heat treating volatile evolving materials within a substantially air tight enclosure having a flue stack for directing gases fed thereto from said enclosure into the atmosphere, a substantially air tight passageway for the feed of hot processed products from said enclosure to a substantially air tight quenching area, subjecting said processed products to a cooling operation while in said quenching area, a substantially air tight conduit extending from said quenching area to an incinerator area positioned intermediate the said enclosure and said flue, combusting in said incinerator area unburned volatiles and carbonaceous particulates emanating from said enclosure and from said quenching area to thereby exit from said flue a gas substantially free of any air contaminants.

3,867,262

PRODUCTION OF TERPENELESS ESSENTIAL OILS

Louis B. Rockland, Orinda, and Charles R. Debenedict, Glendale, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 21, 1973, Ser. No. 362,620
Int. Cl. C07g *17/00;* B01d *3/12*
U.S. Cl. 203—41 5 Claims

1. A process for preparing a terpeneless essential oil, which comprises

a. molecularly distilling the essential oil to separate the volatile fraction as the distillate from non-volatile components,

b. adsorbing said distillate on neutral alumina which has been pre-treated with ethyl acetate,

c. eluting the alumina with a terpenophilic solvent to remove the terpene constituents of the essential oil,

d. eluting the alumina with an oxygenated organic solvent to remove the oxygenated constituents of the essential oil, and

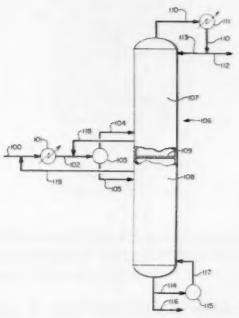
e. recovering a substantially terpeneless essential oil from the oxygenated organic solvent eluate.

3,867,263

PRODUCTION AND PURIFICATION OF VINYL CHLORIDE

Henry H. Wall, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 95,972, Dec. 7, 1970, abandoned, which is a division of Ser. No. 632,002, April 19, 1967, abandoned. This application Mar. 11, 1974, Ser. No. 449,769
Int. Cl. B01d *3/14, 3/32*
U.S. Cl. 203—81 9 Claims



1. A method for distilling a multi-component stream having a gaseous phase and a liquid phase comprising:

A. separating the gaseous phase from the liquid phase;

B. passing the separated gaseous phase and liquid phase to a distillation column divided into a separate upper zonule and a separate lower zonule by a blind plate wherein the separated gaseous phase is passed to the upper zonule for separate distillation thereof and the separated liquid phase is passed to the lower zonule for separate distillation thereof;

C. distilling the gaseous phase and the liquid phase in their respective zonules while,

1. withdrawing from the upper zonule,

a. as a substantially pure gaseous distillate, one of the components of said gaseous phase, and

b. as a liquid distillate, at least one other component of said gaseous phase other than the component in the gaseous distillate, and

2. withdrawing from the lower zonule,

a. as a liquid effluent, components of said liquid phase, and

b. as a gaseous effluent, at least one other component of said liquid phase other than the components in the liquid effluent; and

D. recombining at least part of the liquid distillate and at least part of the gaseous effluent with the multi-component stream.

3,867,264

ELECTROFORMING PROCESS

Bradley A. Carson, Monrovia, Calif., assignor to Bell & Howell Co., Chicago, Ill.

Filed Mar. 30, 1973, Ser. No. 346,564
Int. Cl. C23b *7/00, 5/60*
U.S. Cl. 204—4 11 Claims

1. An electroforming process for duplicating the surface contour of a form comprising the steps of:

coating the surface of a plastic form having a surface contour to be duplicated with a mixture comprising the combination of a metal compound capable of being reduced to its active metal constituent so as to form catalytic bonding sites for a further metal plating process, binder material comprising one or more polymers and/or poly-

mer formers, and at least one solvent for said binder material and metal compound, said binder material forming a polymeric substance having poor adhesion for said form surface;

1. PREPARE SOLUTION OF CATALYTIC METAL COMPOUND POLYMER FORMER & SOLVENT
2. APPLY SOLUTION TO SUBSTRATE
3. DRY AND/OR CURE TO PROVIDE A POLYMER LAYER
4. ELECTROLESSLY PLATE METAL ONTO THE POLYMER LAYER
5. ELECTROPLATE METAL LAYER TO DESIRED THICKNESS
6. REMOVE PLATED METAL FROM SUBSTRATE

drying said binder to a polymer layer on said form;

electrolessly plating a conductive metal layer on said polymer layer;

electroplating metal onto said electrolessly plated metal to a thickness of at least 0.5 mil; and

removing said plated metal from said form.

3,867,265

PROCESS FOR ELECTROPLATING AN ALUMINUM WIRE

Hans Olof Hansson, Sollentuna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 128,742, March 29, 1971, abandoned. This application Feb. 27, 1973, Ser. No. 336,171

Int. Cl. C23b *5/58*

U.S. Cl. 204—28 **3 Claims**

1. In a process for electroplating an aluminum wire with a metal selected from the group consisting of nickel, copper, tin, zinc and cadmium which comprises the steps:

i. etching the wire through an acid bath,

ii. rinsing the wire by passing it through water, and

iii. electroplating the wire with at least one of said metals by passing the wire through an electrolyte which contains at least one of a fluoroborate or sulfamate salt of at least one of said metals, the aluminum wire being the cathode and the selected metal the anode,

said acid bath consisting of 4 percent by weight of 48 percent hydrofluoric acid, 30 percent by weight of 37.9 percent of hydrochloric acid, and 66 percent by weight of water, and being at a temperature of about 60° C, said wire being in contact with the acid bath for about 13 seconds.

3,867,266

METHOD OF PLATING ALUMINUM-CHROMIUM ALLOYS

Akira Miyata; Hideyo Okubo; Chikayoshi Tomita; Akio Suzuki, and Hidenobu Ito, all of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kanagawa, Japan

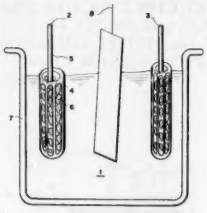
Filed May 5, 1972, Ser. No. 250,525

Claims priority, application Japan, May 14, 1971, 46-32700

Int. Cl. C23b *5/32*

U.S. Cl. 204—39 **6 Claims**

1. A method of electroplating a chromium-containing aluminum coating on the surface of a metal article by immersing said metal article in a molten aluminum salt bath comprising aluminum chloride and containing at least one alkali metal



chloride and chromium ions in an amount of 1 to 5.5 g/l and electrodepositing a coating of an aluminum-chromium alloy onto the surface of said metal article.

3,867,267

CHROMIUM PLATING

Henry Brown, Huntington Woods, Mich., and William A. Boycott, Ontario, Canada, assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Nov. 15, 1973, Ser. No. 416,124

Int. Cl. C23b *5/06*

U.S. Cl. 204—51 **7 Claims**

1. An aqueous acidic hexavalent chromium electroplating bath containing dissolved therein an organic compound selected from the class of carbonyl substituted benzene sulfonamides and their organic hydrolytic products in concentrations of about 0.1 **to about** 10 grams per liter to cause an increase in craze-cracking tendency of the chromium plate derived from the bath.

3,867,268

RECOVERY OF ZINC FROM ZINC SULPHIDES BY DIRECT PRESSURE LEACHING

Paul Kawulka; Walter J. Haffenden, both of Alberta, and Vladimir N. Mackiw, Islington, Ontario, all of Canada, assignors to Gordon Sherritt Mines Limited, Toronto, Ontario, Canada

Filed Aug. 21, 1973, Ser. No. 387,833

Claims priority, application Canada, Nov. 20, 1972, 157147

Int. Cl. C22d *1/22;* **C22b** *19/22*

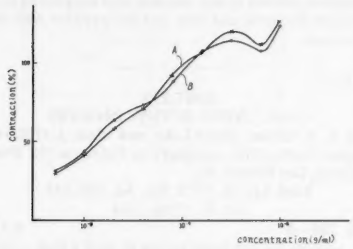
U.S. Cl. 204—119 **14 Claims**

1. The process for extracting zinc from iron containing zinciferous mineral sulphides which comprises the steps of dispersing finely divided iron containing zinciferous sulphides in an aqueous sulphur acid solution to form a slurry; adjusting the relative amounts of acid and said sulphides in the slurry such that there is at least sufficient acid present to combine with the zinc content of said sulphides as zinc sulphate, providing in said slurry an effective amount of a surface active compound compatible with the acid sulphate leach solution which is operative, under the reaction conditions of the following oxygen reaction step, to render said sulphides wettable by aqueous acid solution in preference to molten sulphur, reacting the slurry with free oxygen bearing gas in a closed reaction vessel at a temperature above the melting point of sulphur but below that temperature at which any substantial portion of the sulphide sulphur is oxidized to sulphate form, continuing said reaction with active agitation to effect substantially complete extraction of zinc values from said sulphides as soluble zinc sulphate with concurrent conversion of sulphide sulphur associated with said zinc values to elemental form, and separating product leach solution containing dissolved zinc values from the undissolved residue.

3,867,269
PROCESS FOR PRODUCING PEPTIDES

Yasutsugu Shimonishi, Nishinomiya, and Satomi Takahashi, Osaka, both of Japan, assignors to The President of Osaka University, the Ministry of Education, Japanese Government, Osaka-shi, Japan

Filed Mar. 5, 1974, Ser. No. 448,237
Claims priority, application Japan, Mar. 7, 1973, 48-27438
Int. Cl. B01j *1/12*
U.S. Cl. 204—158 S 7 Claims



1. In producing a peptide by coupling an amino acid or oligomer thereof with an amino acid or its oligomer bound to a resin to form a peptide on the resin, cleaving the peptide from the resin and thereafter extracting the peptide, a process which is characterized in that said peptide forming reaction is conducted under the irradiation of ultrasonic waves.

3,867,270
UV CURING OF CONJUGATED DIENE-CONTAINING BUTYL RUBBER

Alberto Malatesta, Brussels, Belgium, and Francis P. Baldwin, Summit, N.J., assignors to Esso Research and Engineering Company

Filed Sept. 13, 1973, Ser. No. 397,084
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.18 10 Claims

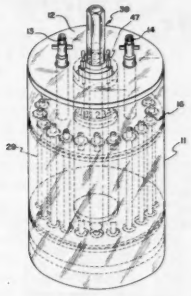
1. A method of vulcanizing a copolymer consisting of 85 to 99.5% by weight of an isoolefin having about 4 to about 7 carbon atoms combined with 15 to about 0.5% by weight of a conjugated diolefin having about 4 to about 14 carbon atoms containing in the linear backbone conjugated diene unsaturation which comprises blending with said rubber from 0.01 to 5.0 parts of an ultraviolet light-responsive photosensitizer per 100 parts of said rubber (phr) wherein said photosensitizer is selected from the group consisting of benzophenone, propiophenone, cyclopropyl phenyl ketone, acetophenone, 1,3,5-triacetyl benzene, benzaldehyde, thioxanthane, authraquinone, β-naphthyl phenyl ketone, β-naphthaldehyde, β-acetonaphthone, 2,3-pentanedione, benzil, fluorenone, pyrene, benzanthrone, and anthracene, and subsequently exposing said blend to ultraviolet radiation for a time sufficient to crosslink at least 70 percent of said rubber.

3,867,271
GEL ELECTROPHORESIS APPARATUS AND METHOD

Stanton Albert Hoefer, San Francisco, Calif., assignor to Hoefer Scientific Instruments, San Francisco, Calif.

Filed Aug. 13, 1973, Ser. No. 387,693
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 G 16 Claims

1. A gel electrophoresis apparatus comprising a container having an open end, a gel tube holder removably fitted in said container, sealing means cooperating between said container and said gel tube holder to define an upper and lower buffer chamber within said container and a cooling chamber disposed therebetween, means in communication with said cooling chamber for providing an inlet and an outlet path therefore, a plurality of gel tubes extending through said cooling chamber having internal bores communicating with said first

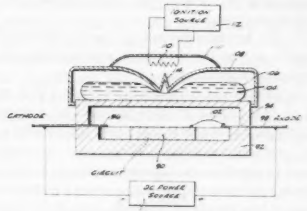


and second buffer chambers, and means mounted within said container for providing an electrical potential between said upper and lower buffer chambers.

3,867,272
ELECTROLYTIC ANTICOMPROMISE APPARATUS

John B. Rust, Malibu, and Gary S. Smolker, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 51,312, June 30, 1970, Pat. No. 3,775,274.
This application Jan. 23, 1973, Ser. No. 325,984
Int. Cl. B01k *3/00*; C23b *3/12*
U.S. Cl. 204—194 14 Claims



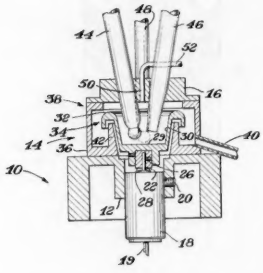
1. An anticompromise apparatus for destruction of the identity and usefulness of an otherwise operable electronic microcircuit comprising:

a source of direct current electrical power having an anode and a cathode, said anode coupled to the microcircuit;

means coupled to the microcircuit for containing a solution of electrolyte in isolation from the microcircuit and from said cathode, said solution including a composition capable of electro-de-plating at least portions of the microcircuit upon supply of the power from said source to said solution; and

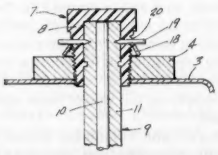
means coupled to said containing means for placing said solution in contact with the microcircuit and for effecting an electrical circuit including said source, said solution and the microcircuit for the destruction of at least the portions of the microcircuit in a nonselective uncontrolled manner whereby identification and recognition of at least the portions is frustrated.

3,867,273
AUTOMATIC ELECTROMETRIC ANALYSIS
Jack J. Gilbert, Suffern, N.Y., assignor to Photovolt Corporation, New York, N.Y.
Filed July 26, 1972, Ser. No. 275,298
Int. Cl. G01n 27/46
U.S. Cl. 204—195 R 8 Claims



1. In a device for electrometric analyses of liquids comprising an analysis cell for containing a liquid to be analyzed, an electrometric sensing electrode adapted to contact liquid in said cell, means connected to the electrode for carrying out the electrometric analysis, means for introducing liquid into said cell and means for removing liquid therefrom, the improvement wherein the cell comprises:
a cell housing;
a cup having an open end, the cup being mounted for rotation with its open end uppermost, the open upper end of said cup being disposed within said housing in air communication therewith but spaced therefrom to provide an air gap between the open end of the cup and the housing;
means on the housing for introducing liquid into the cup across the air gap; including a liquid inlet port in the housing disposed above the open end of the cup and spaced therefrom;
means on the housing mounting the electrometric sensing electrode so that the electrode extends into said cup and is spaced therefrom; and
means for selectively rotating the cup at a first speed sufficient to mix liquid in the cup and at a second speed sufficient to expel the liquid from the cup by centrifugal force.

3,867,274
NOVEL ANODE FITTING
Roger Samuel Herman, Guilford, Conn., assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Oct. 24, 1973, Ser. No. 409,034
Int. Cl. C23f 13/00
U.S. Cl. 204—197 13 Claims



1. An anode fitting for use in the prevention of the corrosion of a metallic structure containing a corrosive liquid which comprises:
A. a non-metallic plug member comprising a threaded outer portion adapted to be threadedly received within an opening in the structure and a hollow cylindrical inner portion;
B. a cylindrical anode telescoped to said inner portion and secured thereto; and
C. means for electrically connecting said anode and said structure which comprises several metal pins in perpendicular relation to the long axis of said anode and partially embedded therein and extending beyond said plug member, and a metallic cup-shaped washer placed over the threaded portion of said member and adapted to be compressed between said pins and the exterior wall of said structure.

COAL

3,867,275
COAL LIQUEFACTION PROCESS
William K. T. Gleim, Island Lake, and Mark J. O'Hara, Mt. Prospect, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Apr. 9, 1973, Ser. No. 349,344
Int. Cl. C10g 1/04
U.S. Cl. 208—8 6 Claims

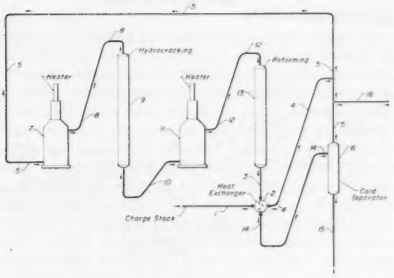
1. A process for the liquefaction of coal which comprises the steps of:
a. contacting the coal, at a temperature of from about 600°F. to about 850°F., a pressure of at least about 100 atmospheres and a time period of from about ½ to about 24 hours, with a liquefaction solvent comprising a partially hydrogenated condensed ring aromatic hydrocarbon boiling above about 400°F. and having from 1 to 4 adjacent CH_2 groups in which the carbon atom of the CH_2 group forms part of the condensed ring structure, said solvent further comprising an alkane or cycloalkane C_{12} and heavier having a boiling point above about 400°F., the weight ratio of the first-mentioned solvent component to the second-mentioned solvent component being from about 1:2 to about 2:1;
b. separating the resultant mixture into a solids phase and a liquids phase;
c. recovering a first hydrocarbonaceous product from said liquids phase;
d. contacting said solids phase with a benzene or alkylbenzene solvent, the alkylbenzene having an alkyl group of from 1 to 4 carbon atoms, at a temperature of from about 50°F. to about 300°F., a pressure of from about 1 to about 10 atmospheres and a time period of from about ½ to about 24 hours; and e. recovering a second hydrocarbonaceous product from the mixture resulting from step (d).

3,867,276
HIGH OCTANE MOTOR FUEL PRODUCTION
Charles V. Berger, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Continuation-in-part of Ser. No. 237,776, March 24, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 405,251
Int. Cl. C10g 37/10
U.S. Cl. 208—60 7 Claims

1. In a process for the production of a high octane motor fuel which comprises the steps of:
a. reacting naphtha boiling range hydrocarbons containing cyclic components, with hydrogen, in a first reaction zone, in contact with a first catalytic composite of a Group VIII noble metal component and a zeolitic aluminosilicate carrier material and at a temperature in the range of about 350° F. to about 800° F. and a pressure from about 100 to about 400 psig.;
b. reacting the resulting first reaction zone effluent, without intermediate separation thereof, in a second reaction zone, in contact with a second catalytic composite comprising platinum and alumina, at a temperature in the

range of about 800° F. to about 1,100° F. and at a pressure of from 100 to about 400 psig.; and

c. recovering said high octane motor fuel from the resulting second reaction zone effluent;



the method of maintaining the over-all exothermic temperature increase in said first reaction zone at a relatively high value while preventing a runaway exothermic reaction, which method comprises increasing said first reaction zone pressure within said range of from about 100 to about 400 psig. in response to catalyst deactivation.

3,867,277

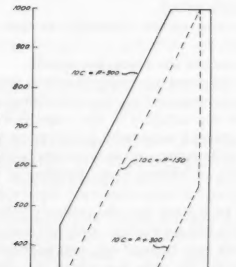
LOW PRESSURE HYDROCRACKING PROCESS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 23, 1973, Ser. No. 363,246

Int. Cl. C10g *13/02*

U.S. Cl. 208—111 **17 Claims**



1. A process for the hydrocracking of a mineral oil feedstock boiling above the gasoline range to produce hydrocarbons boiling in the gasoline range, which comprises contacting said feedstock plus added hydrogen with a catalyst comprising a Group VIII metal hydrogenating component supported on a metal-cation-deficient Y zeolite base containing less than about 1 weight-percent sodium as Na_2O, said Y zeolite base having been stabilized by calcining an ammonium form thereof for a time and at a temperature sufficient to reduce the unit cell size thereof by at least about 0.2 percent, said contacting being carried out at a space velocity above about 0.5 and at a temperature correlated with hydrogen pressure (*P*), in psi, so as to give a volume-percent conversion per pass (*C*) to C_4–400°F end point gasoline falling, as does (*P*), within the polygon shown in the drawing and defined by the lines, $P = 300$, $P = 1000$, $C = 15$, $C = 90$, and $10C = P-300$.

3,867,278

HYDROCRACKING PROCESS USING IMPROVED PD-ON-SILICA-ALUMINA CATALYST

Lloyd J. Olson, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 250,400, May 4, 1972, Pat. No. 3,801,515. This application Oct. 23, 1973, Ser. No. 408,875

Int. Cl. C10g *13/02*; **B01j** *11/12, 11/40*

U.S. Cl. 208—111 **13 Claims**

1. A hydrocracking process comprising contacting a hydrocarbon feedstock and hydrogen with a catalyst under hydrocracking conditions, said catalyst being prepared by a method which comprises:

A. forming in an aqueous medium a gelatinous precipitate and a finely divided catalytically active metal, said precipitate comprising an inorganic oxide or precursor thereof and said metal being formed by reduction in said medium of a metal compound dissolved therein, and said precipitate comprising on a water-free basis from 40 to 95 weight percent alumina and 60 to 5 weight percent silica, and said metal being palladium, and wherein ascorbic acid is used as a reducing agent for said reduction;

B. intimately admixing said precipitate and said metal within 2 hours of formation of said precipitate, thereby forming a catalyst precursor;

C. converting said precursor to a catalyst, said converting including at least a step of heating said precursor at 500°–1,800°F for 1 to 48 hours.

3,867,279

HYDROCARBON CRACKING WITH CATALYTIC PHOSPHATE-SILICA-ALUMINOSILICATE COMPOSITIONS OF IMPROVED CRUSHING STRENGTH

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 273,418, July 20, 1972,. This application Feb. 4, 1974, Ser. No. 439,446

Int. Cl. C10g *11/18*; **B01j** *11/82*; **C01b** *33/28*

U.S. Cl. 208—114 **6 Claims**

1. The hydrocarbon conversion process comprising the steps of passing a fluid hydrocarbon stream having an initial boiling point of at least about 400° F over the particulate catalyst composition hereinafter detailed under hydrocarbon conversion conditions including a temperature of at least about 500° F, a pressure of at least about 500 psig. and a flow rate sufficient to convert said hydrocarbons in the presence of said catalyst particles and cause the physical attrition of said catalyst particles, wherein said catalyst comprises a structurally stable silica-bonded aggregate containing at least about 2 weight percent of a particulate silicate selected from the group consisting of silica gels, physical mixtures and cogels of silica and another refractory oxide, and crystalline aluminosilicate zeolites, and an amount of phosphorus corresponding to about 1 to about 30 weight percent of P_2O_5, formed by the method consisting essentially of the steps of reacting a mixture of said silicate and a colloidal hydrous silica sol in the presence of water and at a temperature of at least about 40° F for a period of at least about 10 minutes sufficient to react said silica sol with said silicate wherein said silica sol has an average particle diameter below about 1 micron and constitutes at least about 5 weight percent of said aggregate on a dry weight basis, admixing with the resultant combination of said silicate and silica sol about 1 to about 30 weight percent determined as P_2O_5 of a polyphosphate or polyphosphate precursor convertible to a polyphosphate at elevated temperatures selected from the group consisting of phosphoric acids, ammonium salts of phosphoric acids, and hydrogen and ammonium phosphates of polyvalent metal cations having ionic radii less than about 1 angstrom, forming particle-form aggregates of the resultant combination of said silicate particles, silica sol and polyphosphate or polyphosphate precursor, and drying the resultant combination at a temperature of at least about 200° F for at least about 30 minutes.

3,867,280
REFORMING WITH PT-IR CATALYSTS PROMOTED BY EITHER BI OR FE

John D. Paynter, Louisville, Ky., and William M. Bunting, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 16, 1973, Ser. No. 388,907
Int. Cl. C10g *35/08*
U.S. Cl. 208—139 5 Claims

1. A process for improving the octane quality of naphtha which comprises contacting said naphtha in an on-oil portion of an operating cycle at reforming conditions with a catalyst composite including a porous inorganic oxide support, halogen in concentration ranging from about 0.1 to about 2 percent, platinum in concentration ranging from about 0.05 to about 3 percent, iridium in concentration ranging from about 0.05 to about 3 percent, and iron or bismuth in concentration ranging from about 0.5 to about 5 percent, based on the total weight of the catalyst, and in a subsequent portion of an operating cycle, burning off deposited coke with an oxygen-containing gas, and activating the catalyst by contact with halogen.

3,867,281
HYDROCONVERSION PROCESS

Barry S. Morgan, Concord, and Joseph Jaffe, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 196,205, Nov. 5, 1971, Pat. No. 3,795,632. This application Aug. 1, 1973, Ser. No. 384,854
Int. Cl. C10g *23/02*; B01j *11/40*
U.S. Cl. 208—213 5 Claims

1. In a hydroconversion process wherein a hydrocarbon feedstock is contacted with solid catalyst particles prepared by forming a hydrogel and then shaping the hydrogel into a pellet, and wherein said contacting is carried out at a temperature between 400° and 900°F., and a hydrogen partial pressure between 100 and 10,000 psig, the improvement which comprises using as said catalyst a catalyst prepared by steps comprising adding to said hydrogel a catalyst fines-water mixture containing at least 10 weight percent free water and at least 80 percent total water, before the hydrogel is shaped into a pellet.

3,867,282
PROCESS FOR OIL DEMETALATION AND DESULFURIZATION WITH COBALT-MOLYBDENUM IMPREGNATED MAGNESIUM ALUMINATE SPINEL

Ronald H. Fischer, Cherry Hill; Julius Ciric, Pitman, and Thaddeus E. Whyte, Jr., Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

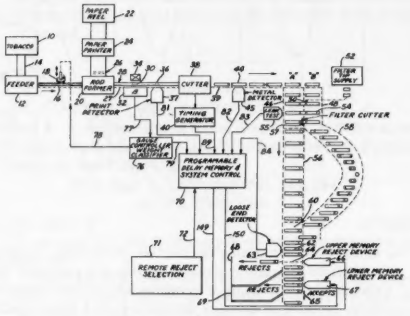
Filed Mar. 27, 1974, Ser. No. 455,442
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 14 Claims

1. A process for demetalation and desulfurization of an oil stock which comprises contacting said oil stock with hydrogen and with a cobalt-molybdenum impregnated magnesium aluminate spinel at a temperature of from about 600°F to about 1,000°F, a pressure of from about 1,000 psig to about 3,000 psig and a liquid hourly space velocity of from about 0.1 to about 2, said spinel having a surface area of greater than about 50 m^2/g and a pore volume of greater than about 0.3 cc/g.

3,867,283
ARTICLE CLASSIFYING SYSTEM AND METHOD

James N. Horn, Hilliard, and David C. Hoffman, Columbus, both of Ohio, assignors to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Mar. 22, 1974, Ser. No. 453,790
Int. Cl. B07c *5/02*
U.S. Cl. 209—74 M 11 Claims



1. In a system for classifying a plurality of articles into either of two categories according to sensed characteristics of each article, which articles are moved successively along at least one prescribed path past at least one sensing station and first and second operating stations, said system having

sensing means disposed along said path responsive to a plurality of given characteristics of each article by providing respective information signals indicative of said given characteristics,

categorizing means responsive to each of said information signals for providing a category signal indicative of the category of the respective article.

first and second operating means at the respective first and second operating stations for acting on an article according to the category of the respective article,

and memory means having a plurality of addressable memory cells in first and second sets, with each cell in one set having an address corresponding to the address of a respective cell in the other set, input means by which signals may be written into the memory cells of one or the other of said sets for storage, output means by which the stored signals may be read out, and address selection means for selecting the cells into which the signals are written and from which the stored signals are read,

apparatus comprising

selectively operable selection means for directing the writing of said category signals corresponding to a respective selected given characteristic of the articles into respective cells of a selected one of said first and second sets of cells selected at the election of the operator, which cells have addresses corresponding to respective ones of said articles,

means for utilizing the signals read from said cells of said first set to actuate said first operating means when the respective articles are at said first operating station, and means for utilizing signals read from said cells of said second set of cells to actuate said second operating means when the respective articles are at said second operating station,

whereby at the respective operating stations the articles are acted upon according to their categories in respect to the respective particular given characteristics selected by the operator.

3,867,284

WATER TREATMENT WITH NITROGEN DIOXIDE

Stanley E. Kappe, Washington, D.C., and David S. Kappe, Elkridge, Md., assignors to Kappe Associates, Inc., Rockville, Md.

Continuation of Ser. No. 259,034, June 2, 1972, abandoned. This application Oct. 18, 1973, Ser. No. 407,587
Int. Cl. C02b *3/08*
U.S. Cl. 210—15 4 Claims

1. A method of treating domestic sewage waste water, comprising dissolving an effective amount of nitrogen dioxide in domestic sewage waste water containing as organic materials: bacteria, other microorganisms, fats, alcohols, aldehydes, ketones, carbohydrates with aldehyde ends, organic acids, ammonia, ammonium compounds, cellulose, primary amines, amino acids and urea, said effective amount being from 1 milligram to 50 grams of nitrogen dioxide per gram of organic material, and then discharging the treated domestic sewage waste water into a waterway, said amount being effective to serve as a source of oxygen for microorganisms present in the waste water, and as an oxidizing agent for aerobic-anaerobic bacterial processes in the waste water, and as a hydrogen acceptor for biochemical reactions in the waste water, and as a chemical reagent that bacteria in the waste water can use as a source of nutrient nitrogen, and as an oxidizing agent that will oxidize fats, alcohols, aldehydes, ketones, carbohydrates with aldehyde ends and organic acids present in the waste water to molecular nitrogen, and as a chemical reagent to convert cellulose and fats present in the waste water to more biodegradable compounds, and as a chemical reagent that will react with primary amines and amino acids which contain an amino group present in the waste water to yield nitrogen and alcohol as degradation products, and as a chemical reagent that will react with urea present in the waste water to yield carbon dioxide and nitrogen as degradation products, and as a chemical reagent for lysis or disintegration of the cell walls of microorganisms present in the waste water so that the material of which the organisms are made can be destroyed by serving as a source of food and energy for other living organisms present in the waste water.

3,867,285

OIL-WATER SEPARATION PROCESS

Howard F. Keller, Jr., 17532 Amaganset Ln., Tustin, Calif. 92680

Continuation-in-part of Ser. No. 228,307, Feb. 22, 1972, abandoned. This application Oct. 15, 1973, Ser. No. 406,253
Int. Cl. B01d *15/06*
U.S. Cl. 210—32 12 Claims

1. A method for treating a fluid system containing oil having an API Gravity value from about 11 to about 70, water and particulate solids to produce clarified water, solids-free oil and oil-free solids which comprises:

A. filtering said fluid system through a finely divided oil and water insoluble filter media containing from about 2 to about 8 cubic feet of filter material for each square foot of filter media surface area, at a flow rate from about 10 to about 35 gallons per minute per square foot of filter media surface area to retain particulate solids and oil within the filter media and pass an effluent selected from the group consisting of:
clarified water and
a mixture of solids-free oil and water which separates into defined layers of solids-free oil and clarified water, said mixture being attained when the oil content of the fluid system is in excess of about 1% by weight,
said filter media having:
i. a minimum particle mesh size within the range from about 3 to about 30 and a maximum particle mesh size within the range from about 30 to about 100 with the range between said minimum and maximum particle mesh sizes being at least 20 mesh,
ii. a median particle mesh size, by weight, which is a function of the API Gravity value of the oil, said median particle mesh size falling within the range defined by maximum and minimum linear values which vary directly with the linear value of said API Gravity, said median mesh size maximum linear value varying from about 18 to 62 and said median mesh size minimum linear value varying from about 10 to 54 as said API Gravity value varies from about 11 to 70, and
iii. a particle size distribution pattern extending from the minimum particle mesh size to the maximum particle mesh size characterized in that the weight of the filter media substantially uniformly and progressively increases from:
a. about 0 to 50 percent as the filter media particle mesh size varies from the minimum particle mesh size to the median particle mesh size, and
b. about 0 to 50 weight percent as the filter media particle mesh size varies from the maximum particle mesh size to the median particle mesh size; and

B. periodically regenerating the filter media by:
passing an oil stripping composition through said filter media in the same direction of flow as that of the fluid system to remove solids-free oil from said filter media, and
thereafter backwashing said filter media in a direction countercurrent to the flow of said fluid system at a rate from about 10 to about 35 gallons per minute per square foot of filter media surface area to remove oil-free particulate solids from said filter media.

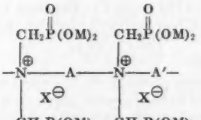
3,867,286

USE OF POLYQUATERNARY AMMONIUM METHYLENE PHOSPHONATES TO CHELATE OR INHIBIT FORMATION OF SCALE

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, Wilmington, Del.

Division of Ser. No. 237,883, March 24, 1972, Pat. No. 3,792,084. This application Oct. 29, 1973, Ser. No. 410,714
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 3 Claims

1. The process of chelating or inhibiting the formation of scale in an aqueous system which tends to form scale which comprises adding to said system a polyquaternary compound having repeating units of the general formula

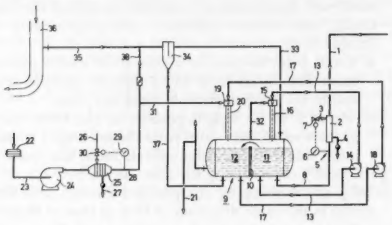


where A is alkylene having 2 to 10 carbon atoms; A′ is alkylene having 2 to 25 carbon atoms, aralkylene having 8 to 10 carbons, alkylene ether —B(OB′)$_n$— wherein B and B′ are alkylene having 1 to 10 carbons and n is 1 to 10, alkenylene or alkinylene; M is hydrogen, ammonium, an alkali metal or an alkaline earth metal; and X is Br, I or Cl.

3,867,287
PROCESS RM FOR PURIFYING INDUSTRIAL WASTE WATERS CONTAINING DIISOPROPYL AMINE

Harald Jakob, Frankfurt, Germany, assignor to Zimmer Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 5, 1973, Ser. No. 376,471
Claims priority, application Germany, July 7, 1972, 2233377
Int. Cl. C02b *1/10*
U.S. Cl. 210—59 **11 Claims**



1. A process for purifying industrial waste water containing undesired amounts of diisopropyl amine by the removal of the amine from the waste water which comprises contacting the waste water, in a contacting zone, in finely divided form, with a continuously renewed stream of air, subsequently separating the resultant air and liquid mixture in a separation zone to produce a purified waste water containing a lesser amount of diisopropyl amine and an air stream containing the removed diisopropyl amine, and removing said purified waste water and air containing amine from said separation zone.

3,867,288
PROCESS FOR TREATING CUTTING AND COOLING OILS

Richard J. Schaefer, 16852 Murray Hill Ave., Detroit, Mich. 48235

Continuation-in-part of Ser. No. 123,145, March 11, 1971, Pat. No. 3,685,656. This application Aug. 21, 1972, Ser. No. 282,271
Int. Cl. C02b *3/08*
U.S. Cl. 210—60 **24 Claims**

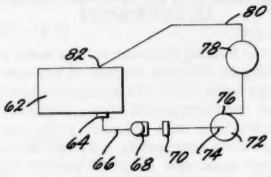
1. A process for retarding the growth of bacteria in a mixture of water and soluble oil used in industrial operations as a coolant and/or lubricant for workpieces comprising repeatedly circulating the mixture over the workpieces and repeatedly contacting the mixture with sufficient ozone to maintain the bacteria level in the mixture below a predetermined maximum bacteria level.

3,867,289
CHECK VALVE AND CHECK INDICATOR

Robert Ortega, 18194 Aztec Ct., Fountain Valley, Calif. 92708

Filed Nov. 8, 1973, Ser. No. 413,938
Int. Cl. B01d *35/14*
U.S. Cl. 210—95 **7 Claims**

1. In a swimming pool system, the combination comprising:
a swimming pool having a pool inlet and a pool outlet;
a pump having a pump inlet and a pump outlet;
said pump outlet positioned above said pump inlet and said pump inlet in flow communication with said pool outlet;
a filter;
said filter positioned between said pump outlet and said pool inlet such that water discharged from the pump passes through the filter before reaching the pool inlet;
a check valve positioned between the pool outlet and the pump inlet;
said check valve permitting the flow of water from the pool outlet to the pump inlet when the pump is operating and said valve preventing the back flow of water through the pump to the pool outlet when the pump is not operating;
said check valve including a valve member with the position of the valve member determined by the flow rate of water through said check valve, and

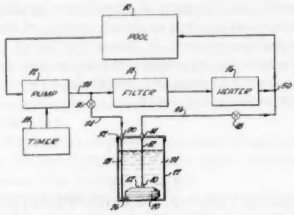


means to determine the position of said valve member when the pump is operating,
whereby the flow rate of water through the check valve and the position of the valve member indicate the presence of obstructions in the swimming pool system.

3,867,290
APPARATUS FOR CHEMICAL TREATMENT OF SWIMMING POOLS

Charles A. Mackey, 10337 Florence Ave., Buena Park, Calif. 90620

Filed June 4, 1973, Ser. No. 366,984
Int. Cl. E04h *3/16*; **B01d** *35/00*
U.S. Cl. 210—138 **12 Claims**



1. In combination with a swimming pool having water recirculating means including a first intermittently operable pump for recirculating the water of the pool, a positive displacement pump for dispensing a metered amount of chlorine in response to operation of said first pump comprising
a chamber adapted to be filled with chlorine,
piston means mounted within the chamber and movable between first and second positions,
means responsive to said first pump for driving said piston means to said first position when said first pump is in operation and for driving said piston means to said second position when said first pump is not in operation,
means for filling said chamber with chlorine as said piston means moves to said second position, and
means for flowing chlorine from said chamber to said swimming pool as said piston means moves to said first position.

7. Water treatment apparatus comprising a positive displacement pump for dispensing a metered amount of a treatment chemical in response to operation of a recirculating pump, said positive displacement pump comprising
a sealed housing defining a chamber therein,
a flexible diaphragm separating the chamber into drive and feed compartments, said diaphragm extending substantially horizontally across said chamber and said chamber having a horizontal dimension considerably greater than its vertical dimension, whereby said diaphragm may be

displaced through a relatively small distance to effect a relatively large change in the volume of said feed compartment,

a recirculating water system including a water treatment device having an input line and an output line, said water system including an intermittently operating recirculating pump,

a first conduit connecting said drive compartment to the input line of said treatment device,

a second conduit connecting said feed compartment to the output line of said treatment device, and

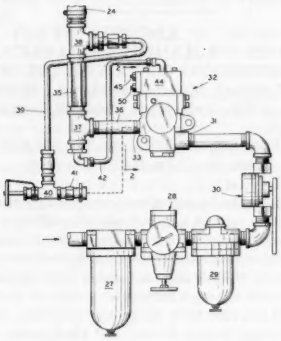
a third conduit connecting said feed compartment to a supply of liquid chemical.

3,867,291

APPARATUS FOR CLEANING FILTERS

Henry Schmidt, Jr., Hinsdale, and Bruce Durham, Berwyn, both of Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Jan. 12, 1973, Ser. No. 323,329
Int. Cl. B01d *35/16*
U.S. Cl. 210—139 **9 Claims**



1. Apparatus for vibrating a filter element, comprising

vibrator means for vibrating at a first frequency in response to the application thereto of fluid at a first pressure, and for vibrating at a second frequency in response to the application thereto of fluid at a second pressure,

means connecting said vibrator means to said filter elements,

first and second conduits connected between a source of fluid under pressure and said vibrator,

a restrictive orifice in one of said conduits and

means for alternately closing said conduits including,

a valve having an inlet connected to said source of fluid, first and second outlets respectively connected to said first and second conduits, and a valve element movable between a first position wherein said inlet is connected to said first outlet and a second position wherein said inlet is connected to said second outlet.

5. In combination with a pressure filter having a plurality of filter elements mounted in a filter tank,

vibrator means having a frequency of vibration which varies with the pressure of an operating fluid supplied thereto, means connecting said vibrator means to said filter elements to vibrate said elements,

conduit means for supplying operating fluid to said vibrator means at substantially different pressures, and

presettable means for alternately supplying said operating fluid to said conduit means at two substantially different pressure valves,

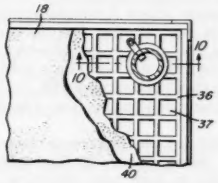
said presettable means including an adjustable timer for presetting the rate of alternation between said pressure values of the operating fluid supplied to said conduit means and thus to said vibrator means.

3,867,292

AQUARIUM FILTER SYSTEM

James H. Cornell, Eugene, Oreg., assignor to Darrel Michael Whitsell and Darrell Melvin, both of Springfield, Oreg.

Filed Apr. 10, 1973, Ser. No. 349,757
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **2 Claims**



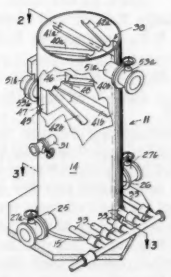
1. In combination with an aquarium, a filter system comprising: an open-pore polyurethane filter element of generally planar configuration positioned in the bottom region of the aquarium, a plurality of liquid passageways formed as a plurality of regularly spaced openings in a supporting member underlying said filter element, a layer of sand of at least as fine as No. 30 grain size overlying said filter element, pump means for drawing a liquid through said layer of sand and subsequently through said filter element into said passageways, said passageways being in direct communication with said pump means which includes a tubular housing disposed vertically within said aquarium, having an inlet opening at the lower end thereof in fluid communication with said liquid passageways to draw liquid therefrom, and an outlet opening at the top end thereof for returning liquid to the aquarium proper, said sand layer further defining a nitrifying bed containing aerobic bacteria, said filter system further including a generally planar base member spaced above the bottom of the aquarium and comprising vertical baffle members intersecting one another to define a gridwork of openings throughout the entire area of the planar base member.

3,867,293

ADSORPTION SYSTEM

Mathew M. Zuckerman, Palo Alto, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed July 23, 1973, Ser. No. 381,961
Int. Cl. B01d *15/06*
U.S. Cl. 210—252 **5 Claims**



1. A system for removing impurities, such as dissolved organic materials, from water comprising:

1. A pair of treatment devices for use in reversible series, each of which comprises:
   a. a vertically arranged housing;
   b. inlet means connected in flow communication with the lower interior of the housing for conveying influent liquid into the housing;
   c. a bed of adsorption material supported and arranged in said housing at least partly above said inlet means for adsorbing dissolved organic matter from the influent liquid;
   d. first filtrate collection means mounted in said housing above said adsorption bed to collect filtrate therefrom, said first filtrate collection means comprising: collection launders which horizontally extend across the interior of said housing, first discharge means connected in flow communication with said launders for discharging the collected filtrate outside said housing and valve means cooperative with said discharge means for selectively stopping the flow of liquid therethrough; and
   e. second filtrate collection means mounted in said housing and spaced above said first collection means to collect filtrate from said adsorption bed when said valve in said first collection means is closed to prevent discharge from said first collection means, said second filtrate collection means comprising: collection launders which horizontally extend across the interior of said housing and second discharge means connected in flow communication with said launders for discharging the collected filtrate outside said housing;
2. A common influent conveying means connected in fluid flow communication with said inlet means of both of said treatment devices and valve means interposed in said influent means to selectively block the fluid flow to either of said treatment devices;
3. Means connecting said second-discharge means of respective ones of said treatment devices to the inlet means of the other one of said treatment devices;
4. Liquid discharge conveying means connected in fluid flow communication with said first discharge means of both of said treatment devices downstream of their respective said valve means for carrying liquid to remote discharge from a selected one of said treatment devices; whereby, in operation, influent is admitted to a selected one of said treatment devices, liquid is discharged from that filtration device via the second discharge means and conveyed, via the associated one of said connecting means, to the other one of said treatment device and then liquid is discharged from this other treatment device, via its first discharge means, into said common discharge conveying means.

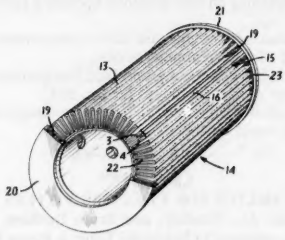
3,867,294

CYLINDRICAL FILTER ELEMENTS WITH IMPROVED SIDE SEAM SEAL

David B. Pall, Roslyn Estates, and Tadas K. Jasaitis, Great Neck, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed May 9, 1973, Ser. No. 358,567
Int. Cl. B01d *27/06*
U.S. Cl. 210—489 **10 Claims**

1. A filter element comprising filter sheet material formed in a substantially cylindrical shape, and having opposite sheet end portions folded over with outer and inner end surfaces in adjacent relation and joined together in a side seam seal, wherein portions of the sheet adjacent the sheet ends have one surface in face-to-face closely-abutting contact, extending to the end edges of the sheet, and the next-adjacent portions have the other surface opposite each other, extending beyond the end edges of the end portions of the sheet, and spaced apart by the folded-over abutting sheet ends, the opposed surfaces of the sheet ends and the end edges of the sheet ends defining a space therebetween, with a bonding agent in the space bonding the sheets together at the end edges and the opposed surfaces of the sheet substantially without penetrating the face-to-face end portions of the sheet at the seam to the outer surface of the filter sheet.



3,867,295

BLOCK COPOLYMERS AND LUBRICANT COMPOSITIONS CONTAINING THE SAME

Frederick C. Schwab, Metuchen, and Israel J. Heilweil, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 13, 1973, Ser. No. 387,845
Int. Cl. C10m *1/40, 1/38, 1/28*
U.S. Cl. 252—33.4 **12 Claims**

1. An organic fluid composition comprising a major amount of a lubricating oil and a minor amount sufficient to provide viscosity index improvement or detergent properties thereto of an oil soluble block copolymer having within its molecular structure an oil soluble segment and a polar segment said oil soluble segment having a molecular weight of about 1,000 to 300,000 and selected from the group consisting of a polymerized alkylstyrene having at least one alkyl group attached to the aromatic nucleus of at least 3 carbon atoms and a hydrogenated diene-styrene copolymer and the polar segment is selected from the group consisting of a polymerized alkylene oxide and alkylene sulfide which polar segment is from 1 percent to about 50 percent by weight of the total copolymer.

3,867,296

PROCESS FOR PREPARING CLEAR BRIGHT OLEAGINOUS ALUMINUM DISPERSIONS

Mack W. Hunt, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 230,065, Feb. 28, 1972, abandoned. This application June 25, 1973, Ser. No. 373,564
Claims priority, application Canada, Oct. 26, 1972, 155062
Int. Cl. C10m *1/40*
U.S. Cl. 252—33.4 **13 Claims**

1. A process for preparing clear, bright aluminum-containing dispersions containing at least 6 weight percent aluminum, said process comprising:
   a. admixing an oil soluble dispersing agent, selected from the group consisting of oil soluble sulfonic acids in which the hydrocarbon portion has a molecular weight between about 350 and 1000 and hydrocarbyl carboxylic acids containing at least 8 carbon atoms, an oleaginous carrier selected from the group consisting of mineral lubricating oils, synthetic lubricating oils, vegetable oils and animal oils and a volatile hydrocarbon solvent having a boiling point at atmospheric pressure below about 300°F. with alumina prepared by the water hydrolysis of aluminum alkoxides and having the following properties:

(1)	Crystal structure - alpha alumina monohydrate	
(2)	Crystal structure after calcining to 900°F - gamma alumina	
(3)	Ultimate crystal size (x-ray diffraction)	
	020 reflection	30–70 A
	021 relfection	60–110 A
(4)	Pore volume	0.35–0.65 cc/g
(5)	Loose bulk density	35–70 lb/ft^3
(6)	Particle size (sieve)	
	45 micron - 20%	
	45 micron - 80%	
(7)	Al_2O_3 content	65–85 wt. %
(8)	Loss on Ignition	15–35 wt. %
(9)	Surface Area	150–350 m^2/g

to form a mixture of uniform consistency;

b. heating said mixture to remove substantially all of said volatile hydrocarbon solvent; and

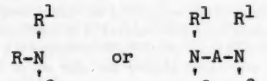
c. recovering said clear bright aluminum-containing dispersion.

3,867,297
LUBE CONTAINING ALKYL AMMONIUM THIOCYANATE

John W. Nebzydoski, Fishkill; Harry Brockway, Beacon; Edwin L. Patmore, Fishkill, and Frederick G. Oberender, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,505
Int. Cl. C10m *1/38*
U.S. Cl. 252—47.5 **6 Claims**

1. A synthetic ester lubricating oil composition of improved load-carrying properties comprising a major portion of an aliphatic ester base oil formed from the reaction of a pentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from 2 to 18 carbons per molecule and between about 0.01 and 5 wt. % of an alkyl ammonium thiocyanate salt product, said salt product prepared by the method of forming a mixture of a thiocyanate reactant of the formula MSCN where M is a member selected from the group consisting of ammonium and monoalkyl ammonium of from 2 to 7 carbons and an alkyl amine of from 6 to 30 carbons of the formula:



where A is alkene of from 2 to 6 carbons, R is alkyl of from 6 to 30 carbons, R^1 and R^2 are hydrogen or alkyl of from 1 to 10 carbons utilizing a ratio of equivalent weight of said amine to mole ratio of said thiocyanate reactant of between about 1:1.2 and 0.9:1, heating the resultant mixture to a temperature of between about 90° and 130°C. while continuously introducing into said mixture an oxygen containing gas at a gas rate of between about 40 and 200 volumes gas per hour per volume said mixture and maintaining said temperature and gas introduction until between about 5 and 0.2 mole oxygen per equivalent weight of initial amine has been introduced.

3,867,298
LUBRICANT

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 117,095, Feb. 19, 1971, Pat. No. 3,780,145. This application Sept. 19, 1973, Ser. No. 398,645
Int. Cl. C10m *1/46*
U.S. Cl. 252—49.8 **1 Claim**

1. A synthetic carboxylic acid ester lubricant in major amounts containing a wear-inhibiting amount of diphenyl-(1-methyl-n-nonylphenyl) phosphate.

3,867,299
METHOD OF MAKING SYNTHETIC RESIN COMPOSITES WITH MAGNETIC FILLERS

Pradeep Kumar Rohatgi, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 11, 1971, Ser. No. 172,340
Int. Cl. Holf *1/24*
U.S. Cl. 252—62.54 **6 Claims**

1. A method of improving the mechanical properties including tensile and flexure strengths and tensile and flexure modulus in synthetic resin, magnetic particle reinforced, composites comprising:

a. providing synthetic resin selected from the group consisting of thermosetting polyester polymers and thermoplastic acrylonitrile-butadiene-styrene polymers in a low viscosity fluid state, combining with said fluid synthetic resin particulate magnetic fume material derived from a steelmaking operation of an average particle size no greater than about 20 microns and in amounts by volume not to exceed about 80% of the total volume of the composite,

b. applying to said fluid synthetic resin and said particulate magnetic fume material a magnetic force in substantially the direction in which improvement in the properties of the final plastic composite is desired of sufficient strength, and maintaining said magnetic force for a time sufficient to magnetically align the magnetic fume material in said resin in planes parallel to said magnetic force; and

c. converting said resin from a fluid to a rigid state while maintaining the particle alignment to form an integral rigid composite wherein said tensile and flexure strength and tensile and flexure modulus of said composite are increased.

3,867,300
BACTERICIDAL COMPOSITION

Joseph V. Karabinos, Orange, and Vincent T. Andriole, Lordship, both of Conn., assignors to Carbolabs, Inc., Bethany, Conn.

Filed Aug. 10, 1972, Ser. No. 279,524
Int. Cl. C11d *1/04, 3/48*
U.S. Cl. 252—106 **6 Claims**

1. An aqueous composition having synergistic bactericidal activity consisting essentially of from 5 to 15 percent of an aliphatic monocarboxylic acid containing from 8 to 11 carbon atoms selected from the group consisting of pelargonic acid, octanoic acid, decanoic acid and undecylic acid, balance a material selected from the group consisting of non-ionic detergents and anionic detergents, said non-ionic detergent being selected from the group consisting of ethoxylated alkylphenols and ethoxylated fatty alcohols, and said anionic detergent being selected from the group consisting of alkyl aryl sulfonates and alkyl sulfates, wherein said composition contains at least 25 percent of acid and detergent and the balance essentially water.

3,867,301
DETERGENT COMPOSITIONS

Yutaka Watanabe; Fumiaki Yamagishi, and Hiroshi Ueno, all of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Sept. 8, 1972, Ser. No. 287,550
Claims priority, application Japan, Sept. 11, 1971, 46-70554; Sept. 13, 1971, 46-71484; Oct. 6, 1971, 46-78872
Int. Cl. C11d *1/04, 9/26*
U.S. Cl. 252—108 **16 Claims**

1. A detergent composition consisting essentially of a mixture of 75 to 97% by weight of a soap with 25 to 3% by weight of a sucrose ester, said sucrose ester comprising at least one sucrose ester of a fatty acid having 12 to 14 carbonatoms and at least 70% by weight of said sucrose ester being mono-and di-esters, the degree of substitution of said sucrose ester given

by the average value of the number of esterified fatty and molecules per one sucrose molecule being within the range of 1.5 to 3.5.

8. A detergent composition consisting essentially of 70 to 90% by weight of a mixture of a soap with a sucrose ester of fatty acid and 30 to 10% by weight of a saccharide, said mixture of a soap of sucrose ester of fatty acid consisting essentially of 75 to 97% by weight of a soap with 25 to 3% by weight of a sucrose ester of fatty acid having 12 to 14 carbon atoms, at least 70% by weight of said sucrose ester being mono-and di-esters, and the degree of substitution of said sucrose ester given by the average value of the number of esterfied fatty acid molecules per sucrose molecule being within the range of 1.5 to 3.5.

3,867,302
ORGANIC PHOSPHORS AND PROCESS FOR PRODUCTION THEREOF

Ryoshiro Takano, Kamakura, and Sadayasu Miyahara, Fujisawa, both of Japan, assignors to Sinloihi Co., Osaka-shi, Japan

Filed Dec. 26, 1972, Ser. No. 318,036
Claims priority, application Japan, Dec. 24, 1971, 46-3609
Int. Cl. C09k *1/02*
U.S. Cl. 252—301.2 R **3 Claims**

1. An aqueous organic phosphorescent printing ink for giving a phosphorescent print capable of emitting phosphorescence upon exposure to ultra-violet radiation, comprising an aqueous solution of at least one water-soluble, polymer substance selected from the group consisting of gelatin, polyvinyl alcohol, gum arabic, tragacanth gum, sodium alginate, carboxymethyl cellulose, carboxyethyl cellulose, and starch and at least one water-soluble, organic phosphorescent activating substance selected from the group consisting of para-aminobenzoic acid, para-methyl-benzoic acid, para-methoxy-benzoic acid, para-hydroxy-benzoic acid, para-hydroxy-diphenyl, salicylic acid, 1-naphthol-4-sulfonic acid, 2-napththol-6,8 -disulfonic acid, 2-napthylamine-5,7 -disulfonic acid, 2-naphthylamine-6,8 -disulfonic acid, 1-naphthylamine-6-(7)-sulfonic acid, 2-naphthol-1-sulfonic acid, 2-naphthol-3,6,8-trisulfonic acid, and 1-naphthylamine-3,6,8-trisulfonic acid wherein said phosphorescent activating substance is present in an amount of 0.5 to 5 percent by weight of said water-soluble polymer substance, said water-soluble, organic phosphorescent activating substance being uniformly distributed in and combined with said polymer in said solution so as to emit intense phosphorescence by ultral-violet radiation after printing.

3,867,303
NEODYMIUM DOPED BORATE GLASS EXHIBITING FLUORESCENCE AT 1.06 MICROMETERS

Robert R. Shaw, Sturbridge, and Elias Snitzer, Wellesley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

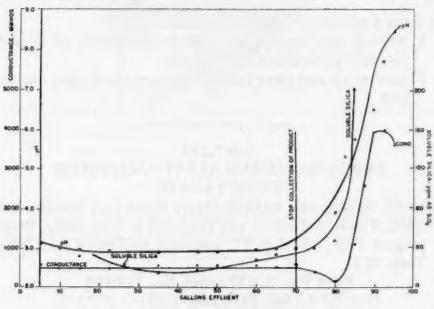
Filed Jan. 11, 1973, Ser. No. 322,672
Int. Cl. C09k *1/66;* **C03c** *3/28, 3/14*
U.S. Cl. 252—301.6 P **9 Claims**

1. A borate glass which exhibits fluorescence at a wavelength of 1.06 um consisting essentially of about 98 weight percent of a host glass consisting essentially of 20 to 80 mol percent of B_2O_3 and 20 to 80 mol percent of a glass modifier selected from the group consisting of Bi_2O_3 and a combination of ZnO and P_2O_5, and approximately 2 weight percent Nd_2O_3 contributing trivalent neodymium ions to the glass.

3,867,304
ACIDIC STABLE SALT-FREE SILICA SOLS

Morris Mindick, Tyler, Tex., and Lewis E. Reven, La Grange Park, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Continuation of Ser. No. 645,176, June 12, 1967, abandoned, which is a continuation-in-part of Ser. No. 103,425, April 17, 1961, Pat. No. 3,342,747. This application Feb. 28, 1972, Ser. No. 230,075The portion of the term of this patent subsequent to Sept. 19, 1984, has been disclaimed.
Int. Cl. B01j *13/00;* **C01b** *33/14*
U.S. Cl. 252—313 S **2 Claims**



1. An acidic stable salt-free silica sol consisting essentially of an aqueous liquid having colloidally dispersed therein from 3% to 50% by weight of substantially discrete, dense, nonagglomerated particles of silica, which particles have a specific surface area of from 50–800 m^2/g, said silica sol having a pH ranging between 2.6 to 3.8 and a specific conductivity not greater than 1,000 micromhos/cm. at 77°F., with the pH and conductivity being derived primarily from the dissociation of the acidic groups on the surfaces of the silica particles, said sol being further characterized by its substantial freedom from occluded sodium ions, said sol being formed by placing a sol containing from about 3% to about 50% SiO_2 in ion exchange relationship with a strong acid cation exchange resin in the hydrogen form; removing said sol from contact with said cation exchange resin; aging said sol out of contact with said cation exchange resin for a period of at least about 4 hours at a temperature of from about 34°F. to about the boiling point of said sol; and again placing the said sol in ion exchange relationship with a strong acid cation exchange resin in the hydrogen form, said sol also having been placed at least once in ion exchange relationship with an anion exchange resin.

3,867,305
AMORPHOUS HYDROCARBON CONVERSION CATALYSTS AND PROCESS FOR PREPARING SAME

Edith Marie Flanigen, White Plains, and Robert William Grose, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 192,344, Oct. 26, 1971, abandoned, which is a continuation of Ser. No. 775,189, Nov. 12, 1968, abandoned. This application July 24, 1973, Ser. No. 382,151
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 **2 Claims**

1. Process for preparing catalyst compositions which comprises providing an aqueous reaction mixture having a composition expressed in terms of mole ratios of oxides as

$$qG_2O \cdot fFe_2O_3 \cdot gL_2O_3 \cdot hSO_4 \cdot iXO_4 \cdot jH_2O$$

wherein G represents at least one cation selected from the group consisting of NH_4^+, H^+, Ag^+, and alkali metal ions, wherein L_2O_3 represents at least one oxide selected from the group consisting of Al_2O_3, Cr_2O_3, V_2O_3, La_2O_3, and Ce_2O_3; XO_4 represents at least one oxide selected from the group consisting of PO_4, MoO_4, VO_4, SiO_4 and TlO_4; q has a value of from 0.5 to 6.0; f has a value of from 1.5 to 4.0; g has a value

of from 0 to 1.0; *h* has a value of from 8.0 to 10.0; *i* has a value of from 0 to 2.0; *j* has a value of from 100 to 1,000; the sum of *f* + g has a value not exceeding 4.0; establishing the pH of said reaction mixture in the range of 1.5 to 4.5, digesting said aqueous reaction mixture within a temperature range of from about 80 to about 200°C. for a period of from at least 4 hours to a period sufficient to complete crystallization, recovering the crystalline reaction product, and calcining the crystalline reaction product at a temperature of from 650°C. to 900°C.

3,867,306

OLEFIN POLYMERIZATION COMPOSITION

Donald R. Witt, and Benny E. Nasser, both of Bartlesville, Okla., assignors to Philips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 237,880, March 24, 1972, abandoned. This application Sept. 17, 1973, Ser. No. 398,081

Int. Cl. B01j *11/34, 11/06, 11/32*

U.S. Cl. 252—452 **8 Claims**

1. A method of preparing a chromium-containing silica composition comprising:

a. adding an alkali metal silicate to an acid to form a hydrogel;

b. aging the hydrogel for greater than one hour;

c. washing the aged hydrogel to produce a substantially alkali metal-free hydrogel;

d. incorporating an aqueous solution of said chromium-containing compound into said thus washed hydrogel;

e. forming a mixture comprising said washed hydrogel and a normally liquid, oxygen-containing, water-soluble organic compound capable of aiding in removing water;

f. thereafter separating said organic compound and said water from said mixture to form a xerogel; and

g. recovering said xerogel as said chromium-containing silica composition.

3,867,307

EXCHANGED FAUJASITE

Julius Scherzer, Baltimore, and Edwin W. Albers, Annapolis, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. Nos. 67,284, Aug. 26, 1970, Pat. No. 3,676,368, and Ser. No. 884,693, Dec. 12, 1969, abandoned. This application Jan. 5, 1972, Ser. No. 215,652

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **3 Claims**

1. A mixed rare earth-transition metal exchanged faujasite which contains 10 to 13% by weight rare earth ion expressed as RE_2O_3; 0.5 to 5% by weight transition metal ion expressed as $M_{2/n}O$ wherein M is selected from the group consisting of zinc, cadmium, thallium, zirconium, manganese, cobalt, nickel, and copper and n is the valence of M; and less than 3% by weight alkali metal measured as Na_2O prepared by the process which comprises:

a. exchanging a sodium faujasite with rare earth metal ion solution to impart the RE_2O_3 content;

b. calcining the faujasite at a temperature of from about 400° to 600°C;

c. exchanging the faujasite with ammonium ion solution to lower the Na_2O content; and

d. exchanging the faujasite with a solution of transition metal ion to impart the M_2O content.

3,867,308 CAT CRACKING

PROCESS FOR PREPARING A PETROLEUM CRACKING CATALYST

Curtis Homer Elliott, Jr., Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,637

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **7 Claims**

1. A process for preparing a petroleum cracking catalyst having high activity and high density which comprises:

a. preparing a silica sol by rapidly decreasing the pH of a sodium silicate solution to pH 1.8 to 3.0,

b. adding clay before, during or after sol formation,

c. preparing a water slurry of a crystalline zeolitic aluminosilicate and adjusting the pH to about 3 to 4.5,

d. mixing said slurry with the silica sol-clay slurry prepared in step (b), to prepare a spray drier feed slurry having a pH of 2.8 to 4.0.

e. spray drying before gellation occurs,

f. washing with water, drying and recovering the product.

3,867,309

CATALYST COMPOSITION FOR REMOVING NOXIOUS COMPONENTS FROM A GASEOUS STREAM

Stephen M. Oleck, Moorestown, and William A. Stover, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 24, 1972, Ser. No. 283,593

Int. Cl. B01j *11/40, 11/08*

U.S. Cl. 252—455 R **17 Claims**

1. A catalyst composition which comprises a refractory support material selected from the group consisting of (1) an alumina having a particle density of from about 0.3 to about 1.5 g/cc, a packed density of from about 0.2 to about 0.8 g/cc and a surface area of from about 10 to about 300 m^2/g and (2) a monolithic ceramic having an external surface area of from about 100 to about 900 ft^2/ft^3, a bulk density of from about 10 to about 50 lb/ft^3 and from about 2 to about 500 channels per square inch, said refractory support material having deposited thereon from about 0.01 to about 10 weight percent palladium and from about 0.05 to about 20 weight percent of a metal selected from the group consisting of rare earth, iron, manganese and zinc.

3,867,310

CATALYST COMPOSITIONS

Curtis H. Elliott, Jr., Baltimore, and Hanson Lee Guidry, Bel Air, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 8, 1972, Ser. No. 251,073

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **5 Claims**

1. A method for preparing a hydrocarbon conversion catalyst which comprises:

a. preparing a mixture of sililca, alumina, alkali metal hydroxide, and water in ratios required to produce synthetic faujasite,

b. reacting said mixture for a period sufficient to produce from about 5 to 70 percent of the crystalline synthetic faujasite which may be theoretically produced from said reaction mixture,

c. combining the product of step (b) with a member selected from the group consisting of silica, alumina, silica-alumina hydrogel, clay and mixtures thereof;

d. forming said mixture into a particulate catalyst composite, and

e. washing said catalyst composite to lower the soda content thereof to less than about 1 percent by weight.

3,867,311

METHOD OF MAKING CATALYTICALLY IMPREGNATED CERAMIC BURNING PADS

Carl E. Johnson, Brookhaven, Miss., assignor to Nalco Chemical Company, Chicago, Ill.

Filed May 21, 1973, Ser. No. 362,609

Int. Cl. B01j *11/08, 11/22*

U.S. Cl. 252—460 **6 Claims**

1. A method of treating platinum or palladium catalyzed porous ceramic burning pads of the types used in flameless gas heating and lighting devices to reduce carbon monoxide emission levels when such devices are used to burn hydrocarbon fuels which comprise the steps of impregnating said pads with

an aqueous solution or dispersion of a catalytic substance containing at least one member from the group consisting of thorium, alkali metal aluminates, silica sols containing a low level of alkali metal and combinations thereof to provide a ratio of catalytic substance or substances to platinum or palladium of at least 1.5 to 1 and then heating said pads at a temperature of from 100 to 300°C for a period of time ranging from .5 to 6 hours to produce a catalytically active porous pad.

3,867,312

EXHAUST GAS CATALYST SUPPORT

Ruth E. Stephens, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 7, 1972, Ser. No. 224,240

Int. Cl. B01f *11/06, 11/22*

U.S. Cl. 252—462 **7 Claims**

1. A process for preparing a thermally stable and attrition resistant catalyst support, said process comprising

a. forming an aqueous solution of a water-soluble, decomposable salt of a lanthanide series metal and a water-soluble aluminum salt;

b. evaporating the free water from said solution to form a uniform solid solution;

c. heating the resultant solid solution of aluminum salt and lanthanide series metal salt whereby said salts are thermally decomposed to their oxides; and

d. cooling said solid solution whereby a solid thermally stable and attrition resistant support material is produced.

3,867,313

NICKEL-FREE, ALL METAL, CATALYST ELEMENT

Gerald L. Brewer, Norwalk, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 101,705, Dec. 28, 1970, abandoned. This application Nov. 1, 1972, Ser. No. 302,955

Int. Cl. B01j *11/06, 11/08*

U.S. Cl. 252—465 **5 Claims**

1. An all metal oxidation catalyst element comprising a base element and a coating of a nobel metal, said coating being at least one metal from the platinum group and said base element being a nickel free alloy consisting essentially of aluminum, chromium and iron, and highly resistant to heat.

HW

3,867,314

PROCESS FOR THE PREPARATION OF A SUPPORTED IRIDIUM CATALYST

Henry Erickson, Park Forest, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Apr. 19, 1973, Ser. No. 352,809

Int. Cl. B01j *11/08*

U.S. Cl. 252—466 PT **10 Claims**

1. A process for the preparation of an iridium-on-alumina catalyst which comprises impregnating an alumina-containing support with a liquid medium containing a soluble iridium compound, maintaining the pH of the liquid medium during impregnation of the support in the range of from 3 to 6 with a base selected from ammonium hydroxide, a lower alkyl amine and mixtures thereof to yield an iridium alumina composite comprising from about 0.01 to about 1 weight % of iridium and subjecting the resulting iridium compositions to drying, calcination and reduction.

3,867,315

RESINOUS COMPOSITIONS HAVING HIGH ELECTROCONDUCTIVITY CONTAINING CU AND METAL SALTS

Reuben A. Tigner, Bay City, and James W. Berg, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 12, 1973, Ser. No. 331,509

Int. Cl. H01b *1/06*

U.S. Cl. 252—512 **14 Claims**

1. An electroconductive resinous composition comprising a resinous material having a volume resistivity greater than 10^6 ohm-cm as the matrix having dispersed therein a finely divided, copper metal-containing solid wherein copper metal constitutes at least 50 volume percent of the solid if copper metal is distributed throughout the solid and at least 10 volume percent if the copper metal forms an essentially continuous layer covering the particle surfaces of the solid and a salt selected from the group consisting of chlorides, bromides, bicarbonates, tetraborates and carboxylates of the alkali metals, calcium, zinc, lead, silver, and copper and the fluorides of sodium and potassium, said solid and salt being present in amounts sufficient to reduce the volume resistivity of said composition below 10^4 ohm-cm.

3,867,316

PROCESS FOR THE MANUFACTURE OF FLOWABLE PASTY DETERGENTS CAPABLE OF BEING PUMPED

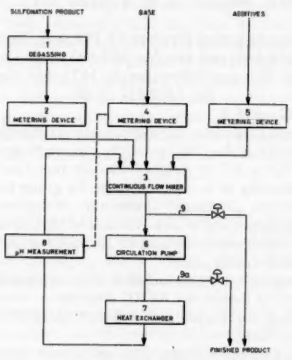
Rudolf Frank, Coventry, R.I.; Horst Reuner, Burghausen, Salzach, and Klaus Ulm, Altotting, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 795,868, Feb. 3, 1969, abandoned. This application May 3, 1972, Ser. No. 250,085

Claims priority, application Germany, Feb. 17, 1968, 1692009

Int. Cl. C11d *1/20, 11/04*

U.S. Cl. 252—545 **1 Claim**



1. In a process for the manufacture of flowable pasty detergents capable of being pumped by neutralization of organic sulfuric acid semi-esters or organic sulfonic acids selected from the group consisting of sulfuric acid semi-esters of fatty alcohols having a chain length of 12 to 18 carbon atoms, oxyethylation products thereof containing 1 to 5 moles of ethylene oxide per mole of fatty alcohol, fatty acid and fatty acid amide oxyethylation products having a chain length of 12 to 18 carbons and containing 1 to 5 moles of ethylene oxide per mole of said fatty acid or fatty acid amide as well as mixtures thereof, aryl and alkylaryl-sulfonic acids having straight-chain or branched alkyl radicals with up to 12 carbon atoms, olefin sulfonic acids having a chain length of 15 to 22 carbon

atoms, and mixtures of the aforesaid classes of compounds, the improvement which comprises removing gases by application of vacuum from the organic sulfuric acid semi-esters or sulfonic acids before they are neutralized, neutralizing them with an alkali in a continuous flow mixer, withdrawing a smaller proportion of the mixture as finished product after it has left the continuous flow mixer, and recycling the larger proportion of the mixture as cycle product into the continuous flow mixer through a cooler, the ratio of said withdrawn finished product to said cycle product being in the range of from about 1:5 to 1:30, the resulting finished product having a washing active substance content of 60 to 70 percent.

3,867,317

SYNTHETIC DETERGENT BARS CONTAINING CALCIUM OLEFIN SULFONATES

Gar Lok Woo, 4 Janet Way, Apt. 105, Tiburon, Calif. 94920, and Ralph House, 3891 Linden Ln., Richmond, Calif. 94803

Filed June 29, 1970, Ser. No. 50,941
Int. Cl. C11d *1/14*
U.S. Cl. 252—555 **5 Claims**

1. Nonsoap synthetic detergent bar having improved slough loss characteristics, said bar consisting essentially of olefin sulfonates the hydrocarbon portions of which have from 8 to 20 carbon atoms and molecular weights in the range of about 165 to 200, said sulfonates being the salts of water-soluble salt-forming cations, at least 80 mol percent of said salts being calcium olefin sulfonates.

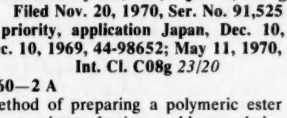
3,867,318

PHOTOSENSITIVE POLYMERIC ESTERS PRODUCED BY THE CONDENSATION OF A CHLOROMETHYL GROUPS-CONTAINING POLYMER WITH A CARBOXYL SALT

Tadatomi Nishikubo; Yoshinori Imamura; Yoshiko Tomiyama, and Kiyoshi Maki, all of Fujisawa, Japan, assignors to Nippon Oil Seal Industry Co., Ltd., Fujisawa, Kanagawa, Japan

Filed Nov. 20, 1970, Ser. No. 91,525
Claims priority, application Japan, Dec. 10, 1969, 44-98651; Dec. 10, 1969, 44-98652; May 11, 1970, 45-39978
Int. Cl. C08g *23/20*
U.S. Cl. 260—2 A **4 Claims**

1. A method of preparing a polymeric ester comprising condensing a polymer having a chloromethyl group in the aliphatic side chain of its repeating unit with a carboxyl salt having the formula:



wherein M is selected from the group consisting of ammonium and alkali metals, R_1 is selected from the group consisting of hydrogen and a nitrile, R_2 is selected from the group consisting of a substituted and non-substituted aromatic, and *a* and *b* are selected from the group consisting of 0 and 1, the chemical equivalent of said salt being not less than 0.3 to the chemical equivalent of the chlorine of said polymer, by adding said salt to said polymer dissolved in an aprotic polar solvent.

3,867,319

PROCESS OF MAKING A FOAMED IONIC POLYMER

Robert D. Lundberg, Somerville, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 29, 1973, Ser. No. 346,093
Int. Cl. C08f *47/10*; **C08j** *1/28*
U.S. Cl. 260—2.5 R **28 Claims**

1. A process for making a foamed polymeric product which comprises foaming a mixture comprising an ionic polymer, said ionic thermoplastic polymer comprising from about 0.2 to 20 mole percent pendant acid groups, said pendant acid groups being selected from the group consisting of carboxylic, sulfonic, and phosphonic fgroups, and said acid groups being neutralized to a degree of at least 90 percent, to form an ionic polymer and a volatile polar compound which is a preferential plasticizer for said ionic polymer said volatile polar compound being present in said mixture at from about 0.1 to 50 moles per mole of ionic groups.

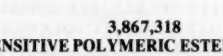
3,867,320

FLAME RETARDANT DENSIFIED POLYURETHANE FOAM

Mario A. Gambardella, Milford, and Frank S. Natoli, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 310,369, Nov. 29, 1972, abandoned. This application Feb. 4, 1972, Ser. No. 439,462
Int. Cl. C08g *22/44*, *51/58*, *53/20*
U.S. Cl. 260—2.5 AJ **11 Claims**

1. A permanently compression-densified, flame retardant, substantially open-cell, flexible polyurethane foam prepared from a foam forming reaction mixture comprised of a polyol, an organic polyisocyanate, a foaming agent, a reaction catalyst, and, per every 100 parts by weight of said polyol, from about 2 to about 4.5 parts of a flame retardant additive having the formula



wherein

R is an aliphatic hydrocarbon radical having 1–8 carbon atoms or phenylene;

X is chlorine, bromine or a mixture thereof;

a is an integer of 0–4; and

R′ is a haloalkyl radical having 1–8 carbon atoms, the halogen being chlorine, bromine, or a mixture thereof.

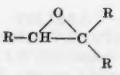
3,867,321

PRODUCTION OF EPIHALOHYDRIN POLYMER LATEX

Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

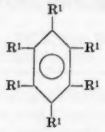
Filed Mar. 18, 1974, Ser. No. 451,927
Int. Cl. C08g *51/24*
U.S. Cl. 260—17.4 ST **7 Claims**

1. A process of preparing a latex from an epihalohydrin homopolymer or copolymer, said homopolymer being a polymer of at least one epihalohydrin selected from the group consisting of epichlorohydrin, epibromohydrin, epiiodohydrin, epifluorohydrin and mixtures thereof and said copolymer containing at least one of said epihalohydrins and at least one other epoxide having the formula



where all R radicals are selected from the group consisting of hydrogen, alkyl and alkenyl radicals containing 1 to 5 carbon atoms, alkoxyalkyl radicals containing 2 to 6 carbon atoms, phenoxyalkyl radicals wherein the alkyl group contains 1 to 6 carbon atoms, and phenyl radicals, but at least one of said R radicals is hydrogen, wherein said process comprises

1. mixing said epihalohydrin homopolymer or copolymer and at least one solvent to form a cement having a viscosity from about 500 centipoises to about 200,000 centipoises, said solvent comprising at least one aromatic hydrocarbon of the formula



where R^1 is hydrogen or an alkyl radical containing 1 to 3 carbon atoms and at least two R^1s are hydrogen,

2. reducing cement viscosity by the addition thereto of at least one polymer nonsolvent, said nonsolvent being selected from the group consisting of alkanes and cycloalkanes containing from 5 to 10 carbon atoms, aliphatic and cycloaliphatic ketones containing from 3 to 10 carbon atoms, aliphatic and cycloaliphatic ethers containing from 3 to 10 carbon atoms, aliphatic and cycloaliphatic alcohols containing from 1 to 10 carbon atoms, and chlorinated aliphatic hydrocarbons containing from 1 to 10 carbon atoms, and wherein about 2 to about 25 parts by weight of said nonsolvent is used per 100 parts by weight of total solvent and nonsolvent, and from about 1 to about 30 parts by weight of polymer is used per 100 parts by weight of total polymer, solvent and nonsolvent,
3. forming a water-in-cement emulsion, and
4. inverting emulsion (3) to a cement-in-water emulsion, wherein suitable emulsifiers are anionic, cationic and nonionic types or any practical combination thereof in an amount from about 0.5 to about 15 parts by weight per 100 parts by weight of polymer, sufficient water is used to form an emulsifier solution to give a final emulsifier solution/polymer weight ratio after inversion of from about 10:1 to about 1:5, from about 10 percent to about 50 percent by weight of said emulsifier solution is used in said step (3) formation of a water-in-cement emulsion, and from about 50 to about 90 percent by weight of said emulsifier solution is used in said step (4) inversion to a cement-in-water emulsion, and
5. removing said solvent and nonsolvent.

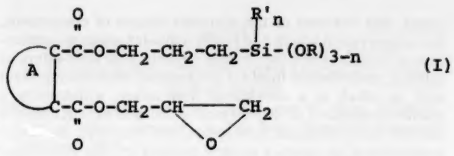
3,867,322

EPOXYSILANE ADDITIVES FOR EPOXIDE RESIN ADHESIVES

Ernst Leumann, Arlesheim, and Hans Lehmann, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 265,919, June 23, 1972, Pat. No. 3,787,452. This application Oct. 2, 1973, Ser. No. 402,882
Claims priority, application Switzerland, June 29, 1971, 9527/71
Int. Cl. C08g *47/10*
U.S. Cl. 260—18 S **5 Claims**

1. A method for improving the adhesive strength and water resistance of epoxide resin adhesives which comprises incorporating in said adhesive from about 0.1 to 5 percent by weight based on the weight of adhesive, an epoxy silane of the formula:



(I)

wherein A is cyclohexane, cyclohexene or benzene, R and R' is alkyl of 1 to 4 carbon atoms, and *n* is 0, 1 or 2.

3,867,323

WATER-DILUTABLE COATING COMPOSITIONS CONTAINING MALEINIZED OIL AND RESOLE

Mahmoud R. Rifi, Kendal Park, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 6, 1973, Ser. No. 367,436
Int. Cl. C08g *45/08*
U.S. Cl. 260—19 R **18 Claims**

11. A composition thinnable with water after neutralization, and which contains free carboxyl groups, which composition is the reaction product of:

a. an adduct of (i) an alpha, beta-ethylenically unsaturated carboxylic acid anhydride, and (ii) a drying or semi-drying composition comprising at least one ethylenically unsaturated fatty acid or an ester thereof with a polyhydric alcohol, a compound having at least one vicinal epoxide group, or an epoxyalcohol, said adduct containing carboxylic anhydride moieties; and
b. a resole containing methylol groups, said adduct and said resole being chemically bonded through ester groups resulting from the reaction of said methylol groups with said anhydride moieties.

3,867,324

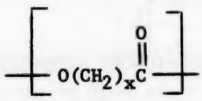
ENVIRONMENTALLY DEGRADABLE-BIODEGRADABLE BLEND OF AN OXYALKANOYL POLYMER AND AN ENVIRONMENTALLY DEGRADABLE ETHYLENE POLYMER

Robert A. Clendinning, New Providence; James E. Potts, Millington, and Stephen W. Cornell, Dunellen, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed July 28, 1972, Ser. No. 275,971
Int. Cl. C09f *29/12*
U.S. Cl. 260—23 H **32 Claims**

1. A biodegradable-environmentally degradable blend comprising

i. from about 5 to about 95 weight per cent of biodegradable thermoplastic polymer, said polymer having a reduced viscosity value of at least about 0.1 and upwards to about 12 and being further characterized in that at least about 10 weight per cent of said biodegradable thermoplastic polymer is attributable to recurring oxyalkanoyl units of the formula



wherein *x* is an integer having a value of 2 to 7, with the proviso that *x* does not equal 3; and

ii. from about 95 to about 5 weight per cent of an environmentally degradable ethylene polymer based composition comprised of

A. at least about 70 weight per cent of normally-solid thermoplastic ethylene polymers of the group consisting of (a) polyethylene, (b) copolymers containing a

major amount by weight of ethylene and a minor amount by weight of unsaturated monomers copolymerizable therewith, and (c) mixtures thereof, and

B. at least one polyvalent transition metal salt in which said metal has an atomic number of from 21 to 30, 39 to 48, and 57 to 71.

3,867,325

ADDITIVES FOR RESINS

Ronald Eric Hutton, Southport; Vincent Oakes, St. Helens, and Brian Rodney Iles, Liverpool, all of England, assignors to Akzo N. V., Arnhem, Netherlands

Filed Feb. 28, 1973, Ser. No. 336,830

Claims priority, application Great Britain, Mar. 3, 1972, 10020/72

Int. Cl. C08f *19/14, 21/04*

U.S. Cl. 260—23 XA **7 Claims**

1. A polyvinyl chloride formulation containing precipitated calcium carbonate filler, the average particle size of which is not more than 250 mμ and a stabilizer composition consisting essentially of a mixture of a zinc soap of a monocarboxylic acid having from 8 to 10 carbon atoms, sulfonic acid of a phenol and at least one soap selected from sodium, calcium, magnesium, barium, aluminum and lead soaps of a monocarboxylic acid having from 6 to 11 carbon atoms, sulfonic acid or a phenol, said stabilizer composition comprising at least 1.5 percent by weight of zinc, based upon the total weight of said stabilizer composition.

3,867,326

PRECIPITATED SILICA REINFORCING AGENTS AND RUBBER COMPOSITIONS CONTAINING SAME

Donald Rivin, Natick, and George R. Cotten, Lexington, both of Mass., assignors to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 337,824, March 5, 1973, abandoned. This application Dec. 13, 1973, Ser. No. 424,575

Int. Cl. C08k *1/08;* **C08c** *11/10*

U.S. Cl. 260—37 N **7 Claims**

1. A siliceous rubber reinforcing composition comprising:

a. precipitated dehydrated silica having an average ultimate particle diameter of between about 10 and about 100 millimicrons; a BET-N_2 surface area of between about 40 and about 275 m^2/g and a free water content of less than about 3 percent by weight thereof, and

b. between about 0.5 and about 6 percent by weight of said precipitated silica of polyethylenimine.

3,867,327

FLAME-RESISTANT POLYBUTADIENE RESIN

David F. Lawson, and Delmar F. Lohr, Jr., both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed July 9, 1974, Ser. No. 486,784

Int. Cl. C08f *45/62*

U.S. Cl. 260—27 BB **9 Claims**

4. A composition curable to a hard resin which, when cured, has substantial flame resistance, which composition comprises:

	Parts by Weight
Butadiene homopolymer or copolymer resin	100
Silica	100 – 500
Vinyltriacetoxysilane	0.05 – 5.0
Calcium stearate	0.5 – 5.0
A peroxide curing agent	0.5 – 6.0
Hexa- or tetrabromobenzene or decaoromobiphenyl or decabromobiphenyl oxide	2 – 20
Chromium naphthenate	0.25 – 10

the resin being from the class consisting of homopolymers of butadiene and copolymers of butadiene and styrene containing at least 40 percent by weight of butadiene, and at least 80 percent by weight of the butadiene repeating units in the homopolymer or copolymer being in the 1,2-configuration.

3,867,328

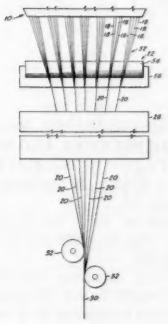
COATING COMPOSITION AND PROCESS FOR PREPARING AND APPLYING THE COATING COMPOSITION TO GLASS FIBERS

Dennis M. Fahey, Aspinwall, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

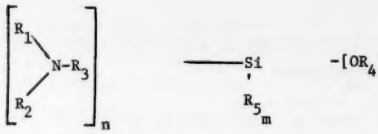
Division of Ser. No. 93,939, Dec. 1, 1970, abandoned. This application Nov. 16, 1972, Ser. No. 307,276

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.3 **3 Claims**



1. An aqueous combined sizing and coating composition for glass fibers comprising: 3 to 15 percent by weight of a resorcinol-formaldehyde resin; 20 to 70 percent by weight of a styrene-butadiene-vinylpyridine terpolymer latex; 0.01 to 3 percent of an amino functional hydrolizable silane coupling agent selected from compounds having the structural formula



wherein R_1 is H, an alkyl radical containing 1 to 5 carbon atoms or H— $NHCH_2 - CH_2-_x$ the x being 1 to 5; R_2 is H or an alkyl radical containing 1 to 5 carbon atoms; R_3 is a biradical selected from lower alkyl radicals having 1 to 8 carbon atoms; R_4 and R_5 are selected from lower alkyl radicals having 1 to 5 carbon atoms; and n is a whole number from 1 to 3 and m is either 0 or 1: ammonia: and 0.1 to 6% by weight of an ammonia soluble carboxyl-containing polymer selected from the group consisting of carboxylated polyvinyl-acetate, carboxylated polystyrene, carboxylated polyethylene, and carboxylated acrylic polymers.

3,867,329

COMPOSITION FOR A HYDROGEL DILATOR ARTICLE OF MANUFACTURE AND METHOD FOR MAKING SAME

Benjamin D. Halpern, Jenkintown, and Murali Krishna Akkapeddi, Feasterville, both of Pa., assignors to Polysciences, Inc., Warrington, Pa.

Filed Aug. 25, 1972, Ser. No. 283,840
Int. Cl. C08f *15/00*
U.S. Cl. 260—29.6 H **26 Claims**

1. A hydrogel composition comprising an intimate mixture on a weight basis of: (A) about 5.0 to 30.0% of glyceryl monomethacrylate in aqueous solution, said weight percentage of said glyceryl monomethacrylate being taken with respect to said aqueous solution; (B) about 0.2 to 4.5% of at least one diacrylate cross-linker from the group consisting of diethylene glycol diacrylate, tetraethylene glycol diacrylate and polyethylene glycol diacrylate, said weight percentage of said diacrylate cross-linker being taken with respect to said aqueous solution; (C) about 0.2% of ammonium persulfate; and, (D) about 0.2% of sodium bisulfite, said weight percentages of said ammonium persulfate and said sodium bisulfite being taken with respect to said glyceryl monomethacrylate in said aqueous solution.

3,867,330

BRINES CONTAINING WATER-SOLUBLE ANIONIC VINYL ADDITION POLYMER AND WATER SOLUBLE CATIONIC POLYMER

Alvin J. Frisque, La Grange, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed July 30, 1973, Ser. No. 383,865
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 NR **5 Claims**

1. An aqueous brine consisting essentially of from 0.1 to 50% by weight of a stable liquid dispersion of:

A. a polymeric latex composed of a water-in-oil emulsion which contains dispersed therein a finely divided water-soluble anionic vinyl addition polymer, said polymer being selected from at least one member of the group consisting of acrylamide polymers and acrylic acid polymers, and said polymeric latex having uniformly distributed therein throughout;

B. a water-soluble cationic polymer selected from at least one member of the group consisting of alkylene polyamine/epichlorohydrin and ethylene dichloride/ammonia polymers with the weight ratio of (A):(B) being within the range of 1:10 to 10:1 and the total amount of (A)+(B) present within said dispersion being within the range of from 0.001 to 75% by weight, said dispersion being uniformly dispersed therethroughout said brine.

3,867,331

PROCESS FOR MAKING EMULSION POLYMERIZED PREPLASTICIZED VINYL RESINS

Bela K. Mikofalvy, Sheffield Lake, and Thomas J. Doyle, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Continuation-in-part of Ser. No. 392,527, Aug. 29, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 457,117
Int. Cl. C08f *45/38*
U.S. Cl. 260—31.8 R **13 Claims**

1. A process of producing preplasticized polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with one or more vinylidene monomers having at least one terminal

grouping comprising forming a monomer premix of the monomer or monomers to be polymerized, from about 5 parts to about 100 parts by weight of a plasticizer for the finished polymer based on 100 parts by weight of monomer or monomers being polymerized, a suitable emulsifier for the polymerization reaction, and the aqueous reaction medium, homogenizing said premix to a particle size in the range of 0.5 to 15 microns with most of the particles being less than 2 microns, passing said homogenized premix to a reaction zone, emulsion polymerizing said homogenized premix in said zone in the presence of catalytic amounts of a suitable catalyst therefor and at a temperature below the glass transition temperature of the polymer or copolymer being produced, and thereafter recovering the preplasticized polymer or copolymer.

3,867,332

PROCESS FOR THE PRODUCTION OF SHAPED ARTICLES OF A LINEAR POLYESTER

Kazuya Chimura, Otake; Kazuo Ito, Tokyo; Yasuo Nakamura, and Seiji Miyata, both of Otake, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Oct. 30, 1972, Ser. No. 302,208
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 P **20 Claims**

1. A process for the production of a linear polyester shaped material having homogeneously dispersed therein an additive which comprises melt shaping a polymer mixture which is either

a. an additive/linear polyester concentrate; or

b. a linear polyester in the form of a powder, pellet or melt having added therein an additive/linear polyester concentrate

wherein said polymer mixture prior to said melt shaping is in the form of a powder having an apparent density of up to 0.3 g/ml said powder having been prepared by either abrasively scraping chips of the polyester or spray drying a solution of the polyester.

3,867,333

NATURAL GRAPHITE-REINFORCED CYCLIZED BUTADIENE ELASTOMERS

Byron M. Vanderbilt, 516 Lake Shore Ln., Chapel Hill, N.C. 27154

Filed Dec. 22, 1972, Ser. No. 317,612
Int. Cl. C08c *11/18*; C08d *11/00*
U.S. Cl. 260—42.32 **8 Claims**

1. A high modulus composite prepared by the cyclization under non-oxidizing conditions, of a substantially emulsifier-free elastomer chosen from polybutadiene and copolymers of butadiene with acrylonitrile or styrene, and having at least 10 percent 1,2-type unsaturation before cyclization, and containing 100–800 parts by weight of natural graphite of at least 85 percent purity per 100 parts of elastomer, said composite being cured with an organic peroxide or quinone prior to cyclization.

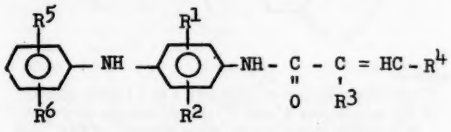
3,867,334

ANTIHARDENERS FOR POLYMERS

Frank S. Maxey, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1974, Ser. No. 438,055
Int. Cl. C08c *11/10, 11/18, 11/46*
U.S. Cl. 260—42.32 10 Claims

1. In a process of preparing an unvulcanized conjugated diene polymer containing a reinforcing agent, said polymer containing not more than 0.25 part by weight per 100 parts by weight of an anti-hardener and being capable of being vulcanized with a sulfur-type vulcanization system to form a vulcanizate, said vulcanizate having a tendency to harden, the improvement wherein an amide, in the amount of at least 0.25 part by weight per 100 parts by weight of polymer, is added to the polymer before all of the reinforcing agent has been added to the polymer with the proviso that the polymer contains less than 30 parts by weight of reinforcing agent per 100 parts by weight of polymer when the amide is added and wherein the amide has the following structural formula:



wherein R^1, R^2, R^5 and R^6 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, wherein R^5 and R^6 can also be alkoxy radicals having 1 to 4 carbon atoms, and wherein R^3 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, aryl radicals having from 6 to 12 carbon atoms, aralkyl radicals having from 7 to 13 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms carboxymethyl radicals and carbalkoxy methyl radicals and wherein R^4 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, aryl radicals having from 6 to 12 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, carboxy radicals and carbalkoxy radicals.

3,867,335

TAPE JOINT CEMENT ADDITIVE

Delmer H. Reed, South Charleston, W. Va., and Edward C. Seltzer, Mt. Holly, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 743,306, July 9, 1968, abandoned. This application Mar. 31, 1972, Ser. No. 240,293
Int. Cl. C08f *45/04*
U.S. Cl. 260—42.52 4 Claims

1. In a tape joint cement composition comprising (a) an inert filler, and (b) a binder, szid binder comprising solid poly(vinyl acetate) selected from the group consisting of vinyl acetate homopolymer and copolymers of vinyl acetate with at least one comonomer selected from the group consisting of dibutyl maleate, dibutyl fumarate, vinyl propionate, ethyl acrylate, butyl acrylate, and 2-ethylhexyl acrylate, the improvement of incorporating in said tape joint cement composition (c) from about 0.5 to about 5 weight per cent, based upon the weight of said binder, of poly(1,2-dimethyl-5-vinylpyridinium methyl sulfate) homopolymer, said poly(1,2-dimethyl-5-vinylpyridinium methyl sulfate) homopolymer having a reduced viscosity of from 0.8 to 1.5 in 0.5 M sodium bisulfite.

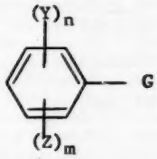
3,867,336

FLAME RETARDANT THERMOPLASTIC COMPOSITIONS

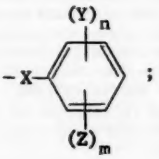
Daniel W. Fox, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1973, Ser. No. 351,105
Int. Cl. C08g *23/00*
U.S. Cl. 260—45.7 R 11 Claims

1. A flame retardant thermoplastic composition comprising:
a. a normally flammable thermoplastic resin; and
b. a flame retardant amount of either
i. an additive of the general formula



wherein Y is bromine or chlorine and mixtures thereof;
Z is mono or dicarbocyclic aryloxy, and mixtures thereof;
G is bromine, chlorine or



X is a direct bond or —O—; and
n is 2, 3, 4 or 5 and *m* is 0, 1 or 2, at least one of the m's always being other than 0, and mixtures of the above additives or
ii. a combination of said additive (i) and an inorganic or organic antimony-containing compound.

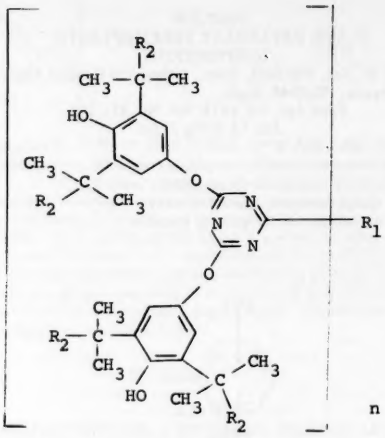
3,867,337

TRIAZINE DERIVATIVES AS ANTIOXIDANTS

Heimo Brunetti, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

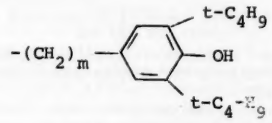
Division of Ser. No. 192,592, Oct. 26, 1971, Pat. No. 3,775,411. This application Mar. 15, 1973, Ser. No. 341,639
Claims priority, application Switzerland, Nov. 9, 1970, 16548/70
Int. Cl. C08f *45/60*; C08g *51/60*
U.S. Cl. 260—45.8 NT 5 Claims

1. A composition of matter comprising an organic polymer and, in an amount of 0.01 to 5% by weight, a compound of formula I



(I)

in which R_1 denotes thiaalkyl with 3 to 20 carbon atoms. alkylene with 4 to 8 carbon atoms or the radical



R_2 denotes methyl or ethyl and *m* and *n* denote 1 or 2.

3,867,338

THERMAL STABILIZATION OF POLYMERS

Dagobert E. Stuetz, Union, N.J., and Joseph Di Pietro, Alma, Mich., assignors to Celanese Corporation, New York, N.Y.

A continuation of Ser. No. 261,174, June 9, 1972, abandoned, which is a division of Ser. No. 551,222, May 19, 1966, Pat. No. 3,671,488

Filed Oct. 19, 1973, Ser. No. 408,134

Int. Cl. C08f *45/60*; C08g *51/60*

U.S. Cl. 260—45.9 P **10 Claims**

1. A composition which is stabilized against thermal degradation consisting essentially of a polymer selected from the group consisting of olefin polymers, copolymers of trioxane and formaldehyde polymers and from 0.5 to 5.0% by weight, based on the weight of said polymer, of a stabilizer selected from the group consisting of phenanthrylmethyl triethyl ammonium chloride and 9,10-dihydroanthrylmethyl triethyl ammonium chloride.

3,867,339

ALPHA CRYSTALLINE LATTICE POLYAMIDES CONTAINAING SODIUM PHOSPHINATE AND A CALCIUM SALT

Ulises Canellas Sanroma, Richmond, Va., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed July 16, 1973, Ser. No. 379,863

Int. Cl. C08g *20/12*

U.S. Cl. 260—45.7 R **16 Claims**

1. A nylon resin comprising a nucleated alpha crystalline lattice polylactam resin formed by adding and blending sodium phenylphosphinate and a calcium salt with a polylactam polymer having from 3 to about 15 carbon atoms in the repeating unit, said sodium phenylphosphinate ranging from 0.01 to about 0.5% by weight based on said polylactam, said calcium salt ranging from 0.01 to about 0.5% by weight based on said polylactam and selected from the group consisting of calcium iodide, calcium chloride and calcium stearate, and melting and crystallizing said blended polylactam polymer.

3,867,340

NICKEL STABILIZERS FOR SYNTHETIC POLYMERS

Michael Rasberger, Allschwil; Jean Rody, Basel; Paul Moser, Riehen, and Helmut Muller, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 31, 1973, Ser. No. 365,801

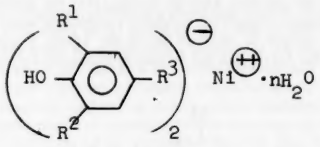
Claims priority, application Switzerland, June 21, 1972, 9334/72

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 N **10 Claims**

1. A composition of matter stabilised against thermal and light degradation and discoloration which comprises a polymonoolefin and a mixture of

A. a nickel benzoate of the formula

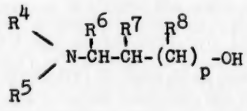


wherein:

R^1 denotes hydrogen or alkyl with 1 to 5 carbon atoms, of the substituents R^2 and R^3, one denotes an alkyl with 3 to 8 carbon atoms and the other denotes $-COO^-$, and

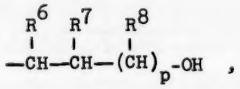
n denotes a value of 0 to 2,

B. an alkanolamine of the formula

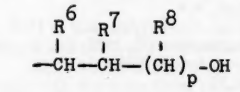


wherein:

R^4 denotes hydrogen, alkyl with 1 to 4 carbon atoms, cycloalkyl with 5 to 10 carbon atoms, aryl with 6 to 10 carbon atoms or a radical of the formula



R^5 denotes hydrogen, alkyl with 1 to 4 carbon atoms or the radical of the formula



or R^4 and R^5 together with the nitrogen atom denote the radical of a 5-membered or 6-membered saturated heterocyclic structure of the pyrrolidine, piperidine or piperazine series,

R^6, R^7 and R^8 denote hydrogen or one of R^6, R^7 and R^8 denotes alkyl with 1 to 4 carbon atoms, and

p denotes 0 or 1,

such that the amount of components (A) and (B) is in the concentration of 0.01 to 5% by weight of the total composition and the molar ratio of A:B is in the range of 1:0.5 to 1:2, C. from 0.05 to 0.1% by weight of the total composition of a hindered phenol antioxidant selected from the group consist-

ing of tetrakis-β(3,5-di-tert-butyl-4-hydroxyphenyl)-propionic acid pentaerythritol ester and β-(3,5-di-tert-butyl-4-hydroxyphenyl)propionic acid octadecyl ester, and

D. from 0 to 0.3% by weight of the total composition of an ester of β-thiodipropionic acid selected from the group consisting of dilauryl thiodipropionate and distearyl thiodipropionate.

3,867,341

METAL 8-HYDROXYQUINOLATE COMPLEXES AS STABILIZERS FOR POLY(PHOSPHAZENES) TO INHIBIT THERMAL DEGRADATION AT ELEVATED TEMPERATURES

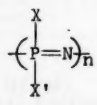
Gary Stephen Kyker, Uniontown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sept. 28, 1973, Ser. No. 401,769

Int. Cl. C08g *51/62;*

U.S. Cl. 260—45.75 R **9 Claims**

1. A polyphosphazene composition stabilized against thermal aging comprising a polyphosphazene represented by the general formula:



wherein *n* represents an integer from 3 up to about 50,000 and X and X′ each represent a monovalent substituent selected from the group consisting of alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, hydroxy and amino, and X and X′ are randomly distributed along the —P=N— backbone and the polyphosphazene includes one or two or more randomly distributed groups and an organometallic compound compatible with said polyphosphazene and present in an amount sufficient to stabilize said polyphosphazene against thermal degradation, said organometallic compound being a metal 8-hydroxyquinolate.

3,867,342

ULTRAVIOLET STABILIZED POLYOLEFINS

Jack P. Guillory, Bartlesville, Okla.; Ralph S. Becker, Houston, Tex., and William B. Hughes, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1974, Ser. No. 447,526

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.85 S **10 Claims**

1. A method for stabilizing an olefin polymer composition against deterioration in the presence of ultraviolet radiation which comprises the addition of a stabilizing amount of 2-hydroxy-4-alkoxythiobenzophenone or 2-mercapto-4-alkoxythiobenzophenone.

3,867,343

CATALYSTS AND USE THEREOF

William David Garden, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 30, 1973, Ser. No. 411,166

Claims priority, application Great Britain, Dec. 11, 1972, 56992/72

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 UA **8 Claims**

1. A composition comprising an organohydrogenpolysiloxane, an α-ω-dihydroxydiorganopolysiloxane and a catalyst consisting of an organic platinum complex in which the ligand or donor groups are selected from the group consisting of groups containing arsenic, phosphorus, sulphur or nitrogen and olefins, said groups being capable of donating electrons to form a bond with platinum, and a nitrogen compound selected from the group consisting of ammonia and derivatives of ammonia in which the three valences are satisfied by bonding to an atom selected from the group consisting of C, H, O, N and Si provided that not more than one O atom is bonded to the ammonia N atom, the ammonia or derivative thereof being present in amount such that the atomic ratio of Pt to the ammonia N atom is from 10:1 to 1:1000 and the organic platinum complex being present in amount from 1×10^{-5} to 1×10^{-2} g. atoms Pt per 1 Kg of total polysiloxanes.

3,867,344

BURN-RESISTANT PLASTIC COMPOSITIONS

Victor S. Frank, Silver Spring; Edwin W. Lard, Bowie, and Eldon E. Stahly, Ellicott City, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 817,144, April 17, 1969, Pat. No. 3,641,193. This application Feb. 16, 1971, Ser. No. 372,701

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **2 Claims**

1. A solid polymeric fire-retardant additive consisting essentially of the reaction product of (a) a member of the group consisting of cyclic $(PNX_2)_y$ where X is a halogen atom and *y* is at least 3 and linear $X(PNX_2)_yPX_4$ where X is a halogen atom and *y* is at least 1; and (b) a compound containing at least two oxirane groups, the equivalent ratio of (a) to (b) being in the range 0.1–2.0:1.0 respectively.

3,867,345

METHOD FOR THE OXIDIZING ALPHA, BETA-UNSATURATED ALDEHYDES TO ALPHA, BETA-NSATURATED CARBOXYLIC ACIDS

Edgar Koberstein, Alzenau; Theodor Luessling, Grossauheim; Ewald Noll, Grosskrotzenburg; Hans Schaefer, Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold-Und-Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Division of Ser. No. 118,965, Feb. 25, 1971,. This application Sept. 27, 1972, Ser. No. 292,628

Claims priority, application Germany, Feb. 27, 1970, 2009172

Int. Cl. C07c *51/26, 57/04*

U.S. Cl. 260—530 N **9 Claims**

1. A process for the production of an unsaturated aliphatic carboxylic acid of the group consisting of acrylic acid and methacrylic acid which comprises passing a mixture of air or other gas containing molecular oxygen, steam, and an unsaturated aliphatic aldehyde of the group consisting of acrolein for the production of acrylic acid, and methacrolein for the production of methacrylic acid, into contact at a temperature between 200° and 350°C and at a pressure between atmospheric and a superatmospheric pressure of 3 atmospheres with a catalyst consisting essentially of oxides or oxygen-containing compounds of the elements antimony, molybdenum, vanadium, and tungsten, supported on a carrier material, the atomic ratios of the elements of the catalyst with respect to molybdenum being respectively between 1 : 12 and 60 : 12 for antimony, between 0.5 : 12 and 25 : 12 for vanadium, and between 0.1 : 12 and 12 : 12 for tungsten, and subsequently recovering the acrylic acid or methacrylic acid from the resulting mixture.

3,867,346

PROCESS FOR THE PRODUCTION OF LIQUID EPOXY-OVOLAK RESINS AND PRODUCT THEREOF

Silvio Vargiu; Mario Pitzalis, both of Milan, and Giancarlo Crespolini, Bergamo, all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Sept. 7, 1973, Ser. No. 395,092

Claims priority, application Italy, Sept. 20, 1972, 29426/72

Int. Cl. C08g *5/18*

U.S. Cl. 260—59 EP **14 Claims**

1. A process for the production of liquid epoxy-novolak resins by reaction of novolak phenolic resins with an epihalo-

hydrin in the presence of an inorganic base, characterized in that

a. a novolak phenolic resin having an average molecular weight of about 220 to 300 and with about 2.2 to 2.9 phenolic hydroxyl groups per molecule and an epihalohydrin are mixed and homogenized, about 5 to 10 moles of epihalohydrin being used per mole equivalent of phenolic hydroxyl groups in the novolak phenolic resin,

b. the homogenized mixture is brought into contact with kieselguhr at temperatures of about 20° to 40° C, the kieselguhr is then separated,

c. an inorganic base selected from the group consisting of alkali metal or alkaline earth metal hydroxides, oxides and carbonates is added to the mixture obtained in accordance with (b) in the course of at least 1 hour at temperatures of about 80° to 115° C, the total quantity of base to be used being so chosen that the ratio of the number of phenolic hydroxyl groups in the novolak resin to the number of equivalents of base is about 0.78:1 to 0.75:1, and

d. the liquid epoxy-novolak resin is separated from the mixture obtained in accordance with (c).

3,867,347

PROCESS FOR THE MANUFACTURE OF PULVERIZABLE THERMOSETTING COATING AGENTS

Wilfried Felber, Grosswelzheim, and Gerhard Morlock, Grossauheim, both of Germany, assignors to Deutsche Gold-Und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

Filed July 24, 1973, Ser. No. 382,227

Claims priority, application Germany, July 26, 1973, 2236514

Int. Cl. C08f *1/80*

U.S. Cl. 260—63 UY **34 Claims**

1. In a process for the preparation of a pulverizable, thermosetting coating agent based on a mixture of an acrylic resin containing hydroxyl groups prepared by substance polymerization of a resin-forming monomer mixture and a blocked isocyanate, the improvement wherein said process comprises dissolving in said monomer mixture about 0.1–0.9 equivalents of isocyanate groups based on the hydroxyl groups, said isocyanate groups derived from at least one di- or polyisocyanate blocked with at least one lactam having about 4–12 carbon atoms, said blocked isocyanate having a melting point of about 60° – 150°C, and polymerizing said monomer mixture at a temperature below about 120°C and in the presence of a catalyst.

3,867,348

CROSS-LINKING AGENT, CROSS-LINKING COMPOSITION CONTAINING SAME, THEIR PRODUCTION AND THEIR USE IN THE TEXTILE INDUSTRY

Alexandre Hirschmann, Stains, France, assignor to Novel Hoechst Chimie, Puteaux, Hauts-de-Seine, France

Filed Nov. 17, 1972, Ser. No. 307,361

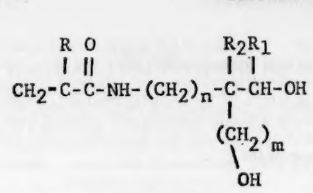
Claims priority, application France, Nov. 29, 1971, 71.42745

Int. Cl. C08g *9/10*, *9/34*

U.S. Cl. 260—70 R **4 Claims**

1. A copolymer cross-linking agent comprising

at least one product obtained by reacting for a time sufficient to obtain said agent, at a temperature of 40°C. to 100°C. and in an aqueous alkaline medium at a pH on the order of about 8.6–8.8, formaldehyde with a mixture of a non-methylolable unsaturated N-substituted amide of α, β-unsaturated carboxylic acid, the substituent of which is an aliphatic moiety containing a diol-1, 2 or 1,3 group, the amide corresponding to the general formula:



wherein R is hydrogen or alkyl: R_1 is hydrogen or a C_1–C_3 alkyl; R_2 is hydrogen, methyl or ethyl; m is an integer from 0 to 1 and n is an integer from 0 to 1 and

at least one nitrogen methylolable compound selected from the group consisting of urea, its substituted derivates and cyclic ureas,

the quantity of formaldehyde used being at most equal to the molecular quantity which could theoretically be fixed to said methylolable nitrogen compound and the minimum quantity of formaldehyde being 2 moles per mole of said nitrogen compound, the molecular ratio between said nitrogen compound and said unsaturated N-substituted amide being at most 5 molecules of said nitrogen compound for 1 molecule of said amide.

3,867,349

ADDITION OF DIMETHYL TEREPHTHALATE AND ETHYLENE GLYCOL TO RECYCLED BIS(HYDROXYETHYL)TEREPHTHALATE

Rudolf Heeg, Oberhochstadt, and Alfred Striebich, Bad Vibel, both of Germany, assignors to Davy-Ashmore Aktiengesellschaft, Frankfurt/Main, Germany

Filed May 3, 1973, Ser. No. 356,796

Claims priority, application Germany, June 3, 1972, 2227091

Int. Cl. C08g *17/01*

U.S. Cl. 260—75 M **14 Claims**

1. In a process for producing a high-polymer particularly a spinnable, polyester composition by ester interchange of dimethyl terephthalate with ethylene glycol as starting materials to produce bis-(2-hydroxyethyl)-terephthalate and subsequent polycondensation of the ester interchange product, in which the dimethyl terephthalate is supplied to the ester interchange stage in a finely divided state for reaction with the ethylene glycol, the improved process which comprises steadily withdrawing a part of the reaction mixture from the ester interchange stage, maintaining the withdrawn mixture at a temperature above the melting point of the dimethyl terephthalate, continuously adding the dimethyl terephthalate in solid form to the withdrawn mixture, homogenizing the added dimethyl terephthalate and withdrawn mixture in a homogenization device to form a homogenized mixture of dimethyl terephthalate and reaction mixture, and returning the resultant homogenized mixture to the ester interchange stage.

3,867,350

POLYURETHANE UREA ELASTOMERS BASED ON POLYCARBONATE MACRODIOLS

Josef Pedain; Klaus Noll, both of Cologne; Klaus Konig, Leverkusen, and Wilhelm Thoma, Bergisch-Neukirchen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

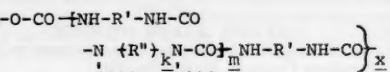
Filed Apr. 20, 1973, Ser. No. 353,036

Claims priority, application Germany, May 4, 1972, 2221751

Int. Cl. C08g *22/10*

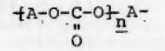
U.S. Cl. 260—77.5 AM **2 Claims**

1. Polyurethane urea elastomers corresponding to the formula:



in which

R represents the group



where 40 to 100 percent by weight of A represents $-CH_2-CH_2-O-_p\,CH_2-CH_2-$ and 0 to 60 percent by weight of A represents $-CH_2-_q$ where

$p = 2–7$,

$q = 6$ or 7,

$n = 2–40$,

R′ represents a divalent $C_6–C_{14}$ aromatic, $C_4–C_{18}$ aliphatic or $C_5–C_{20}$ — cycloaliphatic radical,

R″ represents a divalent $C_6–C_{14}$ aromatic, $C_4–C_{18}$ aliphatic or $C_5–C_{20}$ — cycloaliphatic radical, which may contain nitrogen as heteroatom, or a $-NH-CO-NH-_r R^{IV}-NH-_s CO-NH-$ group

where

R^{IV} is a $C_1–C_{10}$ aliphatic or $C_5–C_{20}$ cycloaliphatic radical,

$r = 0$ or 1;

$s = 0$ or 1

R‴ represents H or a $C_1–C_6$ aliphatic radical,

and

$k = 0$ or 1,

$m = 0–4$,

$x = 5–200$

at least 20 mol % of R′ or R″ being cycloaliphatic radicals or at least 20 mol % of both R′ and R″ being cycloaliphatic radicals.

3,867,351

COMPOSITION FOR PREPARING ELECTROCONDUCTIVE RESIN COMPRISING AN UNSATURATED URETHANE AND PHOSPHORIC OR SULFONIC UNSATURATED ESTER

Kiyoshi Juna; Koji Ohdan; Hiroyuki Nakayama, and Kiyohiko Asada, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki-shi, Hyogo-ken, Japan

Filed Nov. 24, 1971, Ser. No. 201,991

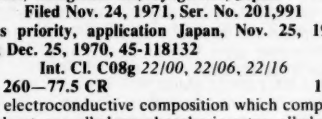
Claims priority, application Japan, Nov. 25, 1970, 45-103328; Dec. 25, 1970, 45-118132

Int. Cl. C08g *22/00, 22/06, 22/16*

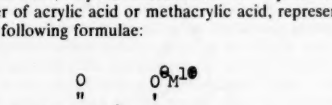
U.S. Cl. 260—77.5 CR **11 Claims**

1. An electroconductive composition which comprises:

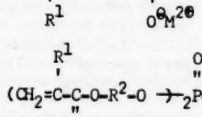
A. at least one alkylene phosphoric ester, alkylene phosphate ester, alkylene sulfonic ester or alkylene sulfonate ester of acrylic acid or methacrylic acid, represented by the following formulae:



;



; or



in which R^1 is hydrogen or a methyl group, R^2 is an alkylene group having 1 to 4 carbon atoms, R^3 is an alkylene group having 1 to 5 carbon atoms, and each of M^1 and M^2 is hydrogen, a monovalent metal, ammonium or monoamine, and

B. urethane unsaturated compound having at least two polymerizable ethylenically unsaturated groups, wherein said urethane unsaturated compound is the reaction product of an ethylenically unsaturated compound having one hydroxyl group and a polyisocyanate having two or three isocyanate groups or a polyisocyanate having two or three isocyanate groups and a polyhydric alcohol having two to four hydroxyl groups.

3,867,352

ISOCYANATE-MODIFIED POLYMERS OF ASPARTIC AND GLUTAMIC ACID AND METHOD OF PREPARING THE SAME

Akira Akamatsu; Akira Okuaki, and Shigeo Mori, all of Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

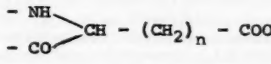
Continuation-in-part of Ser. No. 265,746, June 23, 1972, abandoned. This application Dec. 20, 1972, Ser. No. 316,711

Claims priority, application Japan, July 5, 1971, 46-49421

Int. Cl. C08g *20/00, 20/08, 41/02*

U.S. Cl. 260—77.5 R **10 Claims**

1. A process of improving the wet strength of a solid polymer having repeating units of the formula



which comprises contacting said polymer in a liquid medium with an organic isocyanate having at least one reactive NCO group bound to carbon until a sufficient number of the carboxyl groups in said formula is converted to groups of the formula

$$-CO-NH-$$

substantially to increase said wet strength, n being 1 or 2, said medium being incapable of dissolving said polymer

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3,867,353

POLYMERIZATION OF OXIRANES AND LACTONES

Henry L. Hsieh; Ollie G. Buck, and Floyd E. Naylor, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1973, Ser. No. 324,514

Int. Cl. C08g *17/017*

U.S. Cl. 260—78.3 R **17 Claims**

1. A copolymerization process which comprises the steps:

a. admixing at least one monohalooxirane monomer or monohalooxirane monomer and a lactone and an initiator system consisting essentially of (A) (I) an organoaluminum compound and (II) water or lower alcohol, or (B) (I) an organoaluminum compound, (II) water or lower alcohol, and (III) a beta-diketone or metal salt of a beta-diketone,

b. commencing polymerization of the admixture of said step a) under polymerization conditions,

c. adding thereto during at least a portion of the polymerization of said step (b) a further monomer comprising a lactone, a lactone and an oxirane, a lactone and an oxetane, or a lactone and oxirane and oxetane wherein the addition of said further monomer is delayed after the initiation of said polymerization for a time of about 0.5 to 120 minutes, thereby copolymerizing said monohalooxirane monomer and said further monomer,

wherein said (I) organoaluminum compound is represented by $R_a'AlX_b'$ wherein a is an integer of 1–3, b is an integer

and is 1 or 2, such that $a + b = 3$, X′ is hydrogen or halogen, and R′ is a hydrocarbon radical.

3,867,354

CHROMIUM SALICYLATE CATALYZED EPOXIDE-CARBOXYLIC ACID ESTERIFICATION

Albert Thomas Betts, Waltham Abbey, Essex, and Norbert Uri, London, both of England, assignors to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 15, 1969, Ser. No. 851,775

Claims priority, application Great Britain, Aug. 15, 1968, 38998/68

Int. Cl. C08g *30/12*

U.S. Cl. 260—78.4 EP **21 Claims**

1. In an esterification reaction between an epoxide and a carboxylic acid to form an hydroxyester, the step of providing an esterification catalyst selected from the group consisting of bis- and tris - chromium (III) chelates of:

salicylic acid;

mono- and dialkyl-substituted salicylic acids;

alicyclic-substituted salicylic acids; and aryl and substituted-aryl substituted salicylic acids.

3,867,355

METHOD FOR SPRAY DRYING POLYSTYRENE SULFONIC ACID

Chester D. Szymanski, Martinsville, and Ronald N. Demartino, Wayne, both of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Filed July 20, 1973, Ser. No. 381,287

Int. Cl. C08f *27/06*; **C08d** *11/02, 13/30*

U.S. Cl. 260—79.3 R **5 Claims**

1. In a method of drying a solution of polystyrene sulfonic acid containing free sulfuric acid, the improvement which comprises the step of selectively neutralizing free sulfuric acid present with a stoichiometric amount of barium hydroxide prior to drying of the polymer solution.

3,867,356

ARYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,774

Int. Cl. C08g *23/00*

U.S. Cl. 260—79.1 **19 Claims**

1. A method of producing a polymer which comprises:

a. forming a composition by contacting at least one polyhalo-substituted aromatic compound wherein the halogen atoms are attached to aromatic ring carbon atoms, at least one organic amide, at least one alkali metal aminoalkanoate having the formula $R_2N(CR_2)_nCO_2M$ wherein each R is selected from the group consisting of hydrogen and hydrocarbyl radicals selected from alkyl, cycloalkyl, and aryl and combinations of said radicals, the number of carbon atoms in each of said hydrocarbyl radicals being within the range of 1 to about 12, M is an alkali metal selected from the group consisting of lithium, sodium, potassium, rubidium and cesium, n is an integer of 1 to about 12, and the total number of carbon atoms in each molecule of said alkali metal aminoalkanoate is within the range of 2 to about 24, and an alkali metal bisulfide selected from the group consisting of lithium bisulfide, sodium bisulfide, potassium bisulfide, rubidium bisulfide and cesium bisulfide; and,

b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,867,357

ARYLENE SULFIDE POLYMERS

Lacey E. Scoggins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

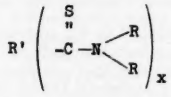
Filed Nov. 19, 1973, Ser. No. 416,778

Int. Cl. C08g *23/00*

U.S. Cl. 260—79.1 **21 Claims**

1. A method of producing a polymer which comprises:

a. forming a composition by contacting a polyhalo-substituted aromatic compound in which the halogen atoms are attached to aromatic ring carbon atoms, a thioamide, a base and an organic amide, said base being selected from hydroxides of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium and barium and the carbonates of sodium, potassium, rubidium and cesium, said thioamide having the formula



wherein each R is selected from the group consisting of hydrogen and alkyl, cycloalkyl and aryl radicals and combinations of said radicals; R′ is selected from the group consisting of hydrogen and hydrocarbon radicals of valence x selected from saturated hydrocarbon radicals, aromatic hydrocarbon radicals and combinations of said radicals, and x is an integer of 1 to 4, with the proviso that when $x = 1$, R′ and one R together can represent a divalent hydrocarbon radical selected from the group consisting of unsubstituted and alkyl-, cycloalkyl- and aryl-substituted alkylene, cycloalkylene and arylene radicals, the total number of carbon atoms in said thioamide being within the range of 1 to about 20; and,

b. maintaining at least a portion of said composition at polymerization conditions to produce said polymer.

3,867,358

VULCANIZATION OF RUBBER WITH PHOSPHORO TRIAZINE SULFIDES

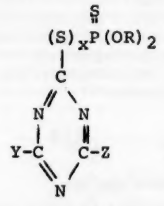
Chester D. Trivette, Jr., and Otto W. Maender, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 3, 1973, Ser. No. 421,126

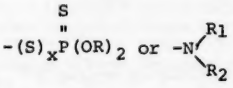
Int. Cl. C08c *11/54*; **C08f** *27/06*

U.S. Cl. 260—79.5 C **25 Claims**

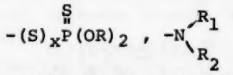
1. The process of accelerating the vulcanization of rubber which comprises heating sulfur-vulcanizable diene rubber and sulfur vulcanizing agent with an accelerating amount of a compound of the formula



in which Y is



and Z is



or Cl in which each R independently is alkyl of 1-8 carbon atoms, cycloalkyl of 5–8 carbon atoms, benzyl, phenyl or tolyl, x is 1 or 2, and R_1 and R_2 independently are hydrogen, alkyl

of 1–8 carbon atoms, cycloalkyl of 5–8 carbon atoms, benzyl, phenyl or tolyl or R_1 and R_2 together with the nitrogen atom from a heterocycle of 4–8 carbon atoms which heterocycle may be interrupted by oxygen or sulfur.

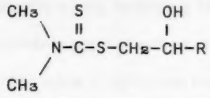
3,867,359

PROCESS OF VULCANIZING NEOPRENE BY USING CERTAIN 2-HYDROXYALKYL N,N-DIALKYLDITHIOCARBAMATES AS ACCELERATORS

Howard C. Beadle, Norwalk, Conn., assignor to R. F. Vanderbilt Company, Inc., New York, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,506
Int. Cl. C08c *11/54*; C08f *27/06*
U.S. Cl. 260—79.5 C 10 Claims

1. A vulcanizable composition comprising a non-sulfur-modified neoprene rubber; an alkaline earth metal oxide; and an accelerator having the generic formula:



wherein R is selected from the group consisting of hydrogen and methyl.

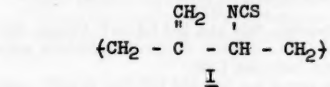
3,867,360

NOVEL ISOTHIOCYANATE POLYMERS

Giffin D. Jones, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 3, 1972, Ser. No. 303,646
Int. Cl. C08f *27/08, 15/00, 3/32*
U.S. Cl. 260—79.7 8 Claims

1. A vinyl addition polymer comprising at least 0.5 mole percent of polymerized moieties of the formula



I

3,867,361

A PROCESS FOR THE POLYMERIZATION OF CYCLIC OLEFINS

Nissim Calderon, and William Allen Judy, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 28, 1966, Ser. No. 537,661
Int. Cl. C08f *5/00*; C08g *33/00*; C08f *1/56*
U.S. Cl. 260—88.2 9 Claims

1. A polymerization process comprising polymerizing at least one unsaturated alicyclic compound selected from the group consisting of (1) unsaturated alicyclic compounds containing 4 or 5 carbon atoms in the cyclic ring and containing 1 carbon-to-carbon double bond in the cyclic ring, and (2) unsaturated alicyclic compounds containing at least 8 carbon atoms in the cyclic ring and containing at least 1 carbon-to-carbon double bond in the cyclic ring, by subjecting said alicyclic compounds to polymerization conditions in the presence of a catalyst system comprising (a) at least one organometallic compound wherein the metal is selected from the group consisting of Ia, IIa, IIb and IIIa of the Periodic Table of Elements, (b) at least one metal salt wherein the metal is selected from the group consisting of molybdenum and tungsten and (c) at least one compound of the general formula R-S-H wherein R is a radical selected from the group consisting of (1) hydrogen, (2) alkyl, (3) aryl, (4) arylalkyl, (5) alkaryl, (6) alkenyl (7) thioalkyl, thioaryl and thioalkaryl and radicals of (2) through (6) wherein at least one hydrogen is substituted by thiol (SH) and wherein the relationship between these three catalyst components defined by (a), (b) and (c) are within a molar ratio of (b)/(c) ranging from 0.3/1 to at least 20/1 and the molar ratio of (a)/(b) is within the range from about 0.5/1 to at least about 15/1.

3,867,362

METHOD OF TELOMERIZING

Emile Trebillon, Neuilly/Seine, and Isidore Raitzyn, Paris, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed June 27, 1973, Ser. No. 374,010
Claims priority, application France, June 29, 1972, 72.23498
Int. Cl. C08f *1/80*
U.S. Cl. 260—91.7 8 Claims

1. A method of telomerizing a monomeric composition comprising an unsaturated monomer selected from the group consisting of vinyl chloride and vinylidene chloride with a telogen which comprises heating the said composition in the presence of a ketone alcohol and a polar solvent selected from the group consisting of an alcohol and acetonitrile at a temperature within the range of 60°–200°C and at a pressure within the range of 1–200 bars, and in which the molar ratio of monomer to ketone alcohol is within the range of 20–2000.

3,867,363

CARCINOEMBRYONIC ANTIGENS

Hans John Hansen, 200 Hillside Ave., Allendale, N.J. 07401

Continuation-in-part of Ser. No. 133,404, Apr. 12, 1971, Pat. No. 3,697,638, which is a continuation-in-part of Ser. No. 110,288, Jan. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 42,526, June 1, 1970, abandoned. This application May 12, 1972, Ser. No. 252,700
Int. Cl. C07g *7/00*; A61k *27/04*
U.S. Cl. 260—112 R 9 Claims

1. A process for producing human carcinoembryonic antigen component A which comprises

a. homogenizing adenocarcinoma tissue;
b. separating the solid particles from the homogenate;
c. treating the supernatant with a glycoprotein solvent in which the carcinoembryonic antigen component A is soluble;
d. separating the precipitate and clarifying the resulting solution;
e. dialyzing the clarified solution against a polyethylene glycol with an average molecular weight of about 15,000 to 20,000 and a softening point at 60°C.;
f. dissolving the retentate in an aqueous buffer of pH from about 5 to 9;
g. subjecting the resulting material to sequential chromatography on two different gel columns, the first of which is an agarose gel having about 6 percent by weight agarose and a particle size of from 40 to 210 microns and the second of which is a hydrophilic water-insoluble cross-linked dextran polymer gel;
h. collecting and concentrating the eluates which have a spectrophotometric absorption peak wave length of 280 mμ and a molecular weight of about 200,000 to 500,000;
i. subjecting the resulting eluates to chromatography on a mixed bed cellulose ion exchange column comprising microgranular diethylaminoethyl cellulose in the free base form having rod shaped particles, a capacity of 1.0 ± 0.1 meq./gm., a particle size distribution of about 20 μ to about 60 μ and a water regain of 2.3 to 2.8 gm/gm. dry exchanger and a microgranular carboxymethylcellulose with a capacity of 1.0 ± 0.1 meq/gm. having rod shaped particles, a particle size distribution of about 20 μ to about 60 μ and a water regain of 2.3 to 2.7 gm./gm. exchanger;
j. collecting the eluates resulting from eluting with ammonium acetate at pH 4 in 0.05 M sodium chloride.

3,867,364

PROCESS FOR THE SYNTHESIS OF LEUPEPTINS AND THEIR ANALOGUES

Hamao Umezawa, Tokyo; Shinichi Kondo, Yokohama; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, and Kenji Maeda, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

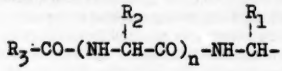
Continuation-in-part of Ser. No. 877,046, Nov. 14, 1969, abandoned. This application Nov. 30, 1972, Ser. No. 310,975

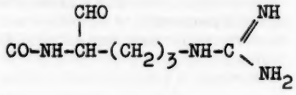
Claims priority, application Japan, Nov. 21, 1968, 43-84824; Nov. 30, 1968, 43-87292; June 11, 1969, 44-45369

Int. Cl. C07c *103/52*; C07g *7/00*; A61k *27/00*

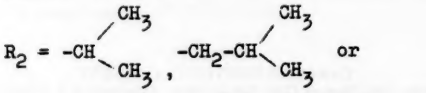
U.S. Cl. 260—112.5 13 Claims

1. Leupeptins and their analogues represented by the general formula:





wherein $n = 1$ or 0, R_1,



R_3 = alkyl radical

3,867,365

PENICILLOYL-POLYLYSINE CONJUGATES HAVING DEXTRO-ROTARY OPTICAL ACTIVITY, AND METHODS FOR THEIR PREPARATION AND USE

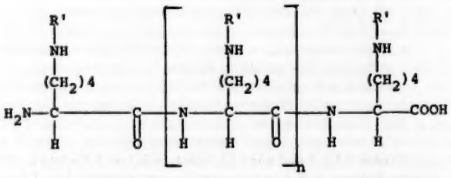
Mark A. Stahmann, Madison, and Sudhakar S. Wagle, Milwaukee, both of Wis., assignors to Kremers-Urban Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 61,514, Aug. 5, 1970, abandoned, which is a continuation-in-part of Ser. No. 656,323, July 27, 1967, abandoned. This application July 24, 1972, Ser. No. 274,325

Int. Cl. C07c *103/52*; C07g *7/00*; C08h *1/00*

U.S. Cl. 260—112.5 28 Claims

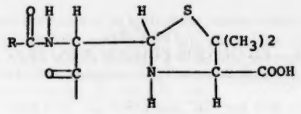
1. The optically active, dextro-rotary water soluble, penicilloyl-polylysine conjugates represented by the formula:



wherein:

n is an integer from about 10 to about 100; and

R′ is selected from the class consisting of H and the penicilloyl substituents represented by the formula:



wherein R is selected from the group consisting of benzyl, allylthiomethyl, phenoxyethyl, phenoxymethyl, 2,6-dimethoxyphenyl, 5-methyl-3-phenyl-4-isoxazolyl, 2-ethoxy-1-naphthyl, and alpha-aminobenzyl, and in which at least 40% of said R′ groups are the penicilloyl substituents;

wherein said conjugates have an optical rotation corrected for the contributions of said polylysine in said conjugates yielding a specific rotation in excess of $[\alpha]_D^{25} + 100°$ for $1 + 10^{-2}$ M penicilloyl groups contained in the conjugates;

said conjugates are free from penamaldate and penicillenate groups;

said conjugates are soluble in water without succinylation.

3,867,366

OPIATE IMIDATES AND PROTEIN CONJUGATES THEREOF

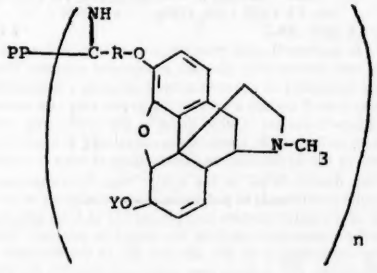
Kenneth E. Rubenstein, Palo Alto, and Edwin F. Ullman, Atherton, both of Calif., assignors to Synvar Associates, a/k/a Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 304,157, Nov. 6, 1972, , and Ser. No. 143,609, May 14, 1971, abandoned. This application May 9, 1973, Ser. No. 358,757

Int. Cl. C07g *7/00*; A61k *23/00*

U.S. Cl. 260—121 5 Claims

1. A conjugate of the formula:



wherein:

y is hydrogen or acetyl;

R is alkylene of from 1–6 carbon atoms, wherein the linkage is through an amidine group;

PP is antigenic poly(amino acid); and

n is at least one and not greater than the molecular weight of PP divided by 500.

3,867,367

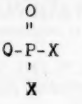
SULFURIZED OLIGOMERIC PHOSPHORODIAMIDATE

Haakon Haugen, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 210,238, Dec. 20, 1971, Pat. No. 3,810,838. This application Sept. 19, 1973, Ser. No. 398,615
Int. Cl. C10m 1/48
U.S. Cl. 260—125 4 Claims

1. A method of preparing a sulfurized reaction product of an oligomeric O-alkyl-N,N'-bis(alkaryl)phosphorodiamidate having an average between about 1 and 4 phosphorodiamidic groups, a sulfur content between about 2 and 8 wt. % and a phosphorus content of between about 4 and 16 wt. % comprising:

1. first contacting an amine of the formula RNH_2 where R is alkaryl of from 12 to 24 carbons with an alkyl dihalophosphate of the formula:



where R' is alkyl of from 2 to 6 carbons and X is chlorine or bromine utilizing a mole ratio of said amine to said dihalophosphate of between about 1.7:1 and 2.3:1 at a temperature between about 170° and 200°C. in the absence of inert diluent solvent and in the absence of catalyst while continuously blowing the reaction mixture with an inert gas and recovering the oligomeric phosphorodiamidate first reaction product,

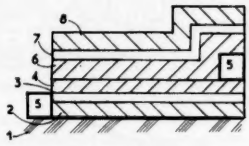
2. second contacting said first reaction product with phosphorus pentasulfide in the presence of an inert liquid diluent at a temperature between about 80° and 150°C. while continuously purging the reaction mixture with an inert gas utilizing a mole ratio of phosphorus pentasulfide to said first reaction product of between about 0.05:1 and 0.5:1 and recovering said sulfurized reaction product.

3,867,368

READ-WRITE MAGNETIC TRANSDUCER HAVING A COMPOSITE STRUCTURE COMPRISING A STACK OF THIN FILMS

Jean-Pierre Lazzari, Villiers Saint Frederic, France, assignor to Compagnie Internationale Pour L'Informatique, Louveciennes, France

Filed Oct. 25, 1973, Ser. No. 409,613
Claims priority, application France, Nov. 7, 1972, 72.39317
Int. Cl. G11b 5/12, 5/22
U.S. Cl. 360—126 8 Claims



1. A read/write transducer comprising: a pair of magnetic pole-pieces and read-write conductor means inductively coupled to said pole-pieces and passing therebetween; each pole-piece including the superposition of:

a first magnetic layer member close to said conductor means;

a magnetostatically decoupling layer means, over said first magnetic layer member; and

a second magnetic layer member of substantially lower permeability, substantially higher saturation flux density and appreciably higher value of anistropy field than said first magnetic layer member.

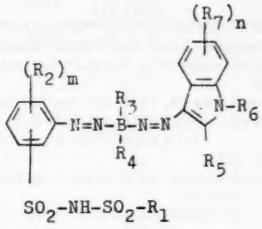
3,867,369

DYESTUFFS CONTAINING A (BENZENESULPHONYL)-SUBSTITUTED SULPHONAMIDE FIRST COMPONENT AND AN INDOLE FIRST COMPONENT

Richard Sommer, Leverkusen-Schlebusch, and Gerhard Wolfrum, Bergisch-Neukirchen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 20, 1972, Ser. No. 245,923
Claims priority, application Germany, Apr. 20, 1971, 2119038
Int. Cl. C09b 31/14
U.S. Cl. 260—165 11 Claims

1. Disazo dyestuff, the free-acid form of which has the formula



in which

B is 1,4-phenylene or 1,4-naphthylene;

R_1 is phenyl; phenyl substituted with C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro or cyano; C_1–C_6-alkyl; or dialkylamino with 1–6 carbon atoms in the alkyl radical;

R_2 is chlorine; bromine; C_1–C_6-alkoxy; C_1–C_6-alkoxy substituted by cyano hydroxy or phenyl; C_1–C_4-alkyl; C_1–C_4-alkyl substituted by cyano, hydroxy or phenyl;

R_3 and R_4 are hydrogen; chlorine; bromine; C_1–C_6-alkoxy; C_1–C_6-alkoxy substituted by cyano, hydroxy or phenyl; C_1–C_4-alkyl; or C_1–C_4-alkyl substituted by cyano, hydroxy or phenyl;

R_5 is C_1–C_4-alkyl; phenyl; or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, cyano or nitro;

R_6 is hydrogen, C_1–C_4-alkyl; or C_1–C_4-alkyl substituted by cyano, carbonamide or carboxy;

R_7 is C_1–C_4-alkyl; C_1–C_4-alkyl substituted by cyano, hydroxy or phenyl; C_1–C_6-alkoxy; C_1–C_6-alkoxy substituted by cyano, hydroxy or phenyl; halogen; nitro; sulfo; or cyano;

m is a number 0–2; and

n is a number 0–2.

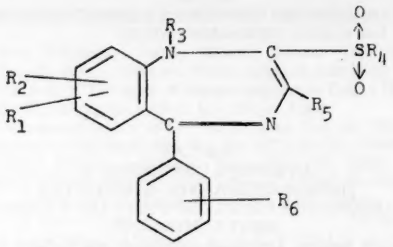
3,867,370

2-LOWER ALKYSULFONYL-1H-1,4-BENZODIAZEPINES

James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffman-LaRoche, Inc., Nutley, N.J.

Division of Ser. No. 187,836, Oct. 8, 1971,. This application June 5, 1974, Ser. No. 476,639
Int. Cl. C07d 53/06
U.S. Cl. 260—239 BD 1 Claim

1. A compound of the formula



wherein R_1 and R_2 are each selected from the group consisting of hydrogen, halogen, trifluoromethyl and nitro; R_3 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower cycloalkyl-lower alkyl, and di-lower alkylamino-lower alkyl; R_4 is lower alkyl; R_5 is hydrogen or lower alkyl; R_6 is selected from the group consisting of hydrogen and halogen

and the pharmaceutically acceptable acid addition salts thereof.

3,867,371

PROCESS FOR PRODUCING PENICILLIN ESTERS

Toshiyasu Ishimaru, Suita, and Yutaka Kodama, Toyama, both of Japan, assignors to Toyama Chemical Co. Ltd, Tokyo, Japan

Filed June 28, 1972, Ser. No. 267,147

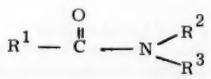
Claims priority, application Japan, July 8, 1971, 46-50447

Int. Cl. C07d *99/16*

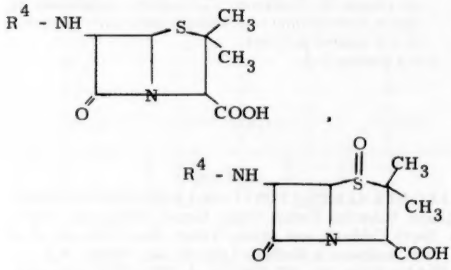
U.S. Cl. 260—239.1 **6 Claims**

1. A process for producing penicillin or penicillin sulfoxide esters, which comprises:

reacting an N,N-disubstituted acid amide represented by the formula:



wherein R^1 represents hydrogen or lower alkyl, and R^2 and R^3, which may be the same or different, each represents a lower alkyl group, with a halogenating agent selected from the group consisting of phosphorous oxychloride, phosphorous oxybromide, phosphorous pentachloride, phosphorous pentabromide, sulfurylchloride, thionylchloride, thionylbromide, phosgene, carbonylbromide and thiophosgene, and reacting the thus obtained product with an alkali metal salt of penicillin or an alkali metal salt of penicillin sulfoxide, wherein said penicillin and said penicillin sulfoxide are selected from the group consisting of



wherein R^4 represents thienylacetyl, N-protected-α-aminophenylacetyl, α-aminothienylacetyl and α-aminosubstituted-phenylacetyl, and Penicillin G and V and sulfoxides thereof; and then reacting the product thus obtained with a hydroxy compound represented by the formula R—OH, wherein R represents halogeno lower alkyl, benzoyl lower alkyl, nitro or lower alkoxy substituted phenyl lower alkyl, nitro and halogen substituted phenyl, bisphenyl substituted lower alkyl or phthalimido, in the presence of an organic tertiary amine selected from the group consisting of pyridine, picoline, lutidine, collidine, quinoline, dimethylaniline, diethylaniline and triloweralkylamine.

3,867,372

BENZODIAZEPINE PROCESS

Hisao Yamamoto, Nishinomiya; Shigeho Inaba, Takarazuka; Toshiyuki Hirohashi, Ashiya; Michihiro Yamamoto, Toyonaka; Kikuo Ishizumi; Mitsuhiro Akatsu, both of Ikeda; Isamu Maruyama, Minoo; Kazuo Mori, Kobe; Yoshiharu Kume, and Takahiro Izumi, both of Takarasuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

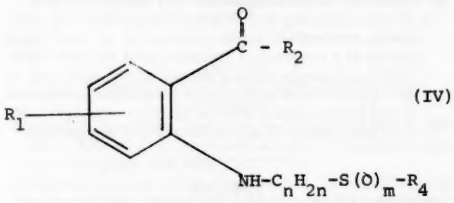
Filed Jan. 29, 1971, Ser. No. 111,141

Claims priority, application Japan, Feb. 3, 1970, 45-9691; Feb. 5, 1970, 45-10533

Int. Cl. C07d *53/06*

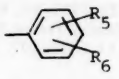
U.S. Cl. 260—239.3 D **4 Claims**

1. A process for preparing benzodiazepine derivatives and salts thereof which comprises reacting in the presence of a solvent and in the presence of an acidic catalyst an aminophenylketone derivative having the formula,

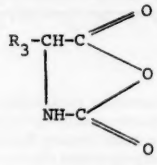


(IV)

wherein R_1 is a hydrogen atom, a halogen atom, a nitro group, a cyano group, a lower alkoxy group or a trifluoromethyl group; R_2 is a pyridyl group or a group of the formula



where R_5 and R_6 represent individually a hydrogen atom, a halogen atom, a C_1 – C_2 alkyl group or a trifluoromethyl group); R_4 is a C_1 – C_4 alkyl group; m is 1 or 2; and n is an integer of 1 to 4, with a 2,5-oxazolidinedione having the formula,



(V)

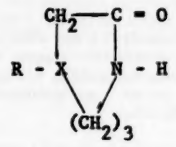
wherein R_3 is a hydrogen atom or a C_1 – C_4 alkyl group, wherein the reaction is carried out at a temperature ranging from −25°C to +120°C and wherein at least one mole of the 2,5-dione derivative is used per mole of the aminophenylketone derivative.

3,867,373
EXTREMELY LOW VISCOSITY ADDUCTS OF LACTAMS WITH WATER OR OXIMES

Kuno Wagner, Leverkusen-Steinbuechel, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 13, 1971, Ser. No. 207,560
Claims priority, application Germany, Dec. 17, 1970, 2062289
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 R **13 Claims**

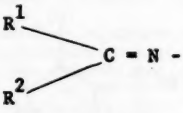
1. Adduct of a lactam having the formula



wherein
X is —CH— and R is hydrogen; or
X is nitrogen and
R is selected from the group of:
alkyl having 1 to 4 carbon atoms;
cycloalkyl having 5 or 6 carbon atoms in the ring;
aralkyl having 1 or 2 carbon atoms in the alkyl portion and phenyl or naphthyl as the aromatic portion; pyridyl; and
lower alkyl-substituted pyridyl,
with a hydroxyl compound having the formula

Y—OH

wherein Y is hydrogen or



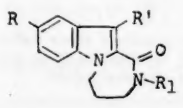
wherein
R^1 and R^2, which can be the same or different, are selected from the group of hydrogen, C_1 to C_{12} alkyl which together optionally may form a 5- or 6-membered carbocyclic ring which optionally can contain a double bond, and benzyl,
said adduct containing from 0.3 to 4 moles of said hydroxyl compound per mol of said lactam.

3,867,374
DIAZEPINOINDOLES

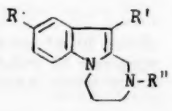
Brian E. Reynolds, Dresher, and John R. Carson, Norristown, both of Pa., assignors to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

Continuation-in-part of Ser. No. 734,532, June 5, 1968,. This application May 28, 1969, Ser. No. 828,727
Int. Cl. C07d *53/02*
U.S. Cl. 260—239.3 T **25 Claims**

1. A member selected from the group consisting of 2,3,4,5-tetrahydro-1H-1,4-diazepino[1,2*a*]indoles having the formulas:



and



wherein R is a member selected from the group consisting of hydrogen, lower alkoxy, chloro and fluoro; R′ is a member selected from the group consisting of hydrogen, lower alkyl and phenyl;
R_1 is a member selected from the group consisting of hydrogen lower alkyl, di-(lower alkyl)-amino-lower alkyl, di-(lower alkyl)-amidomethyl, benzyl and p-tolylmethyl; and R″ is a member selected from the group consisting of hydrogen, lower alkyl, di-(lower alkyl)-amino-lower alkyl, benzyl, p-tolylmethyl and lower alkanoyl; and the therapeutically active acid addition salts of the foregoing basic nitrogen containing compounds.

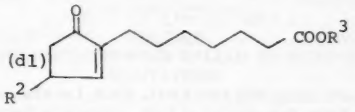
2. 2,3,4,5-Tetrahydro-1H-1,4-diazepino[1,2-*a*]indol-1-one.

3,867,375
REAGENTS FOR PREPARING AND METHOD OF PREPARING PROSTAGLANDINS

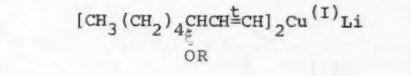
Francisco S. Alvarez, Sunnyvale; Arthur F. Kluge, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 12, 1972, Ser. No. 252,725
Int. Cl. C07c *61/20*
U.S. Cl. 260—240 R **15 Claims**

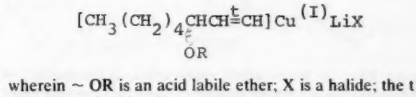
3. A process for preparing prostaglandins and prostaglandin derivatives which comprises treating a compound having the formula



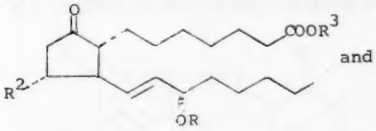
wherein R^2 is hydrogen or acid labile ether having from 3 through 10 carbon atoms; and R^3 is lower alkyl, chloroethyl, dichloroethyl, or trichloroethyl; with a freshly prepared complexed octenol ether copper(I) lithium reagent composition consisting essentially of a (dl) or optically active (S) isomer mixture of compounds having the formulas:



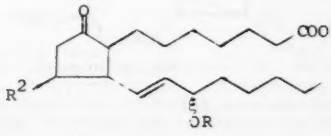
and



wherein ~ OR is an acid labile ether; X is a halide; the t over the double bond indicates the trans configuration; and the wavy line indicates either a (dl) mixture with respect to this asymmetric center or the optically active (S) isomer; complexed by an electron-rich neutral complexing reagent, which coordinates with transition metals, in an inert organic solvent mixture at temperatures in the range of about from −100° to −30°C for about from five minutes to 24 hours, thereby yielding the corresponding mixture of products having the formulas:



and



wherein R^2, R^3 and ~ OR are as defined above.

3,867,376

BIS-S-TRIAZIN-YLAMINO-STILBENE-2,2'-DISULPHONIC ACIDS

Franz Guenter, Riehen; Werner Fringeli, Basel, and Peter Liechti, Binningen, all of Switzerland, assignors to Ciba-Giegy AG, Basel, Switzerland

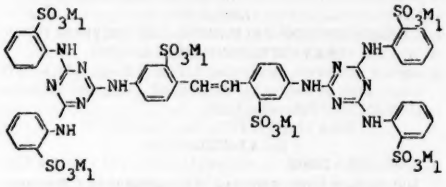
Filed June 27, 1972, Ser. No. 266,848

Claims priority, application Switzerland, July 16, 1971, 10480/71

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 B **1 Claim**

1. A compound of the formula



wherein M_1 represents a sodium, potassium or ammonium ion.

3,867,377

METHOD OF MAKING 13-CIS PROSTAGLANDIN DERIVATIVES

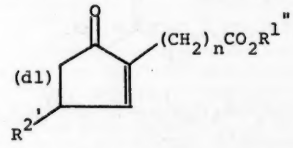
Arthur F. Kluge, Palo Alto; Karl G. Untch, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex, Inc., Palo Alto, Calif.

Filed July 18, 1972, Ser. No. 272,880

Int. Cl. C07c *61/36, 61/32*

U.S. Cl. 260—240 R **14 Claims**

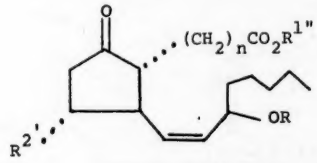
1. A process for preparing 13-cis prostaglandin derivatives which comprises treating a compound having the formula:



(dl)

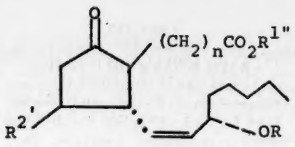
wherein R^1 is lower alkyl, chloroethyl, dichloroethyl or trichloroethyl; *n* is a whole integer of from two through eight; and R^2 is hydrogen or acid labile ether having from three through 10 carbon atoms;

with a freshly prepared complexed cis-octen-3-ol 3-acid labile ether copper(II) lithium reagent, in a mixed inert organic solvent at temperatures in the range of about from −100° to 20°C for about from 5 minutes to 24 hours, thereby yielding: when the said complexed cis-octen-3-ol 3-acid labile ether copper(II) lithium reagent has the (dl) configuration the products having the formulas



and

(l)



(lr)

when the said complexed cis-octen-3-ol 3-acid labile ether copper(II) lithium reagent has the (R) configuration the products having the Formula (l); and when the said complexed cis-octen-3-ol 3-acid labile ether copper(II) lithium reagent has the (S) configuration the products having the Formula (l*r*); wherein R^1, n, and R^2 are as defined herein above; and OR is an acid labile ether.

3,867,378

PREPARATION OF 7-ACYLAMIDO-7-METHOXY-3-SUBSTITUTED METHYL-3(OR 2)-CEPHEM-4-CARBOXYLIC ACID AND ITS S-OXIDES

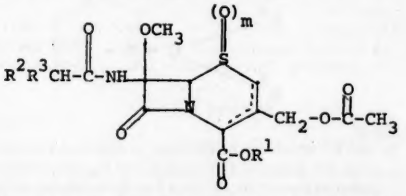
Seemon H. Pines, Murray Hill, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 14, 1971, Ser. No. 207,980

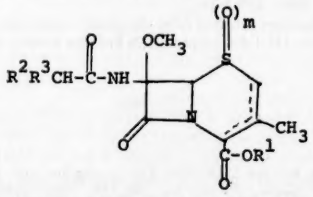
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **4 Claims**

1. A process for preparing a compound of the formula:



wherein R^1 is trichloroethyl, tert-butyl, benzoylmethyl, p-methoxybenzyl, benzyl, benzhydryl, trimethylsilyl, methoxymethyl, benzoylmethylcarbonyloxy, or tert-butylcarbonyloxy; R^2 is hydrogen, halo, amino, hydroxy, tetrazolyl or carboxy; R^3 is phenylthio, cyano, phenyl or substituted phenyl, heterocycle or substituted heterocycle, heterocyclic thio or substituted heterocyclic thio group wherein said heterocycle is selected from the group consisting of furyl, thienyl, thiazolyl, isothiazolyl, oxadizolyl and thiadiazolyl, and wherein said substituent on the phenyl, heterocycle and heterocyclic thio groups is selected from the group consisting of halo, carboxymethyl, aminomethyl, nitro, methoxy and methyl; and *m* is an integer of 0–1, which comprises the step of treating a compound of the formula:



wherein R^1, R^2 and R^3 and *m* are as defined above with a manganese III, Palladium, Mercury II, thallium III or lead acetate acetate in the presence of a potassium halide.

3,867,379
7-SUBSTITUTED CEPHALOSPORANIC ACID AND DERIVATIVES THEREOF

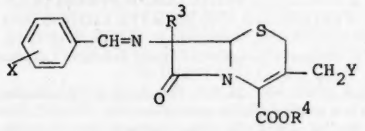
Joseph Edward Dolfini, Princeton, and Ekkehard Bohme, Hightstown, both of N.J., assignors to E.R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 119,034, Feb. 25, 1971, abandoned. This application June 7, 1972, Ser. No. 260,635

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **7 Claims**

1. A compound having the formula:



wherein R_3 is lower alkyl; R^4 is selected from the group consisting of hydrogen, lower alkyl, trichloroethyl, benzyl, methoxybenzyl, and benzhydryl; Y is selected from the group consisting of hydrogen, acetoxy, pyridinium and hydroxy; X is selected from the group consisting of hydrogen, hydroxy, halogen, lower alkyl, lower alkoxy, nitro and amino; and pharmaceutically acceptable salts thereof.

3,867,380
3-HETEROCYCLIC THIOMETHYLCEPHALOSPORINS

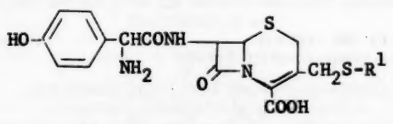
George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to Smithkline Corporation, Philadephia, Pa.

Continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, , which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned. This application June 14, 1972, Ser. No. 262,903

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **9 Claims**

1. A compound of the formula:



in which:

R^1 is tetrazol-5-yl, 1,3,4-thiadiazol-2-yl, 1,3,4-oxadiazol-3-yl, 1,2,4-triazol-3-yl, or 1,2,3-triazol-5-yl, each of such groups being unsubstituted or substituted with one or two lower alkyl groups of one to four carbon atoms or a nontoxic, pharmaceutically acceptable salt thereof.

3,867,381
2-MORPHOLINOMETHYLBENZOPHENONE

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Division of Ser. No. 23,074, March 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 877,455, Nov. 17, 1969, abandoned, which is a division of Ser. No. 581,152, Sept. 22, 1966, Pat. No. 3,497,508. This application Aug. 14, 1972, Ser. No. 280,347

Int. Cl. C07d *87/34*

U.S. Cl. 260—247.7 R **1 Claim**

1. The compound which is 2-morpholinomethylbenzophenone.

3,867,382
PROCESS FOR THE PRODUCTION OF CYANURIC CHLORIDE

Yelagondahally S. Suryanarayana, and Luther J. Reid, Jr., both of Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 142,359, May 11, 1971, abandoned. This application July 24, 1973, Ser. No. 382,245

Int. Cl. C07d *55/42*

U.S. Cl. 260—248 C **2 Claims**

1. In a process for the production of cyanuric chloride by passing cyanogen chloride in the vapor phase over an activated carbon catalyst, the improvement which comprises contacting said cyanogen chloride with a untreated carbon catalyst derived from coconut, said catalyst having an inner surface of about 1,200 to **1,500** sq. meters per gram, an internal micropore volume of at least 0.7 cc per gram and an ash content below 4.0 percent by weight.

3,867,383
MONOANTHRANILATOANILINO-s-TRIAZINES

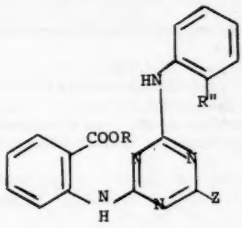
Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Giegy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 129,126, March 29, 1971, abandoned. This application Apr. 12, 1973, Ser. No. 350,566

Int. Cl. C07d *55/22, 55/20*

U.S. Cl. 260—249.6 **4 Claims**

1. A compound of the formula



wherein R is hydrogen or a lower alkyl group,

Z is phenyl or $—NR'_2$ where R' is a lower alkyl group, and R'' is hydrogen or —COOR.

3,867,384
2-AMINO-4(3H)-QUINAZOLINONES

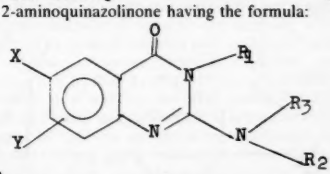
Greg A. Bullock, 2225 Patwynn Rd., and Patrick J. Sheeran, 2707 W. Lock Dr., both of Wilmington, Del. 19810

Filed Sept. 1, 1972, Ser. No. 285,616

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.4 Q **3 Claims**

1. A 2-aminoquinazolinone having the formula:



wherein

R_1 is allyl or C_1–C_3 alkyl;

R_2 is allyl, a C_1–C_6 alkyl or phenyl;

R_3 is hydrogen;

X is halogen; and

Y is hydrogen.

3,867,385

BINUCLEAR N-HETEROCYCLIC POLYGLYCIDYL COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE, AND THEIR USE

Jurgen Habermeier, Pfeffingen, and Daniel Porret, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporaton, Ardsley, N.Y.

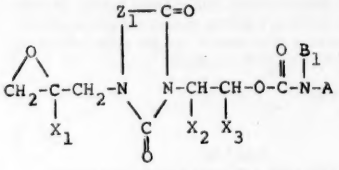
Filed Nov. 21, 1972, Ser. No. 308,625

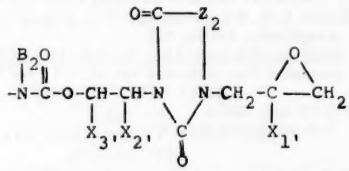
Claims priority, application Switzerland, Nov. 24, 1971, 17126/71

Int. Cl. C07d *51/30*

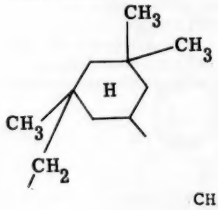
U.S. Cl. 260—256.4 C **9 Claims**

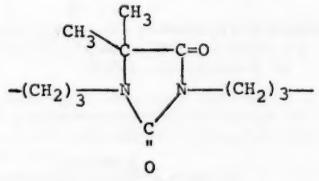
1. A binuclear N-heterocyclic polyglycidyl compound of the formula



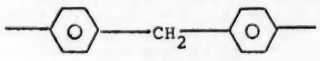


wherein A is tolylene, phenylene, alkylene containing 2 to 10 carbon atoms

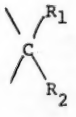




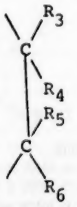
or



Z_1 and Z_2 are the same and each represents a divalent radical of the formula



or



wherein each of R_1, R_2, R_3, R_4, R_5 and R_6 independently of one another is hydrogen or alkyl of 1 to 4 carbon atoms or wherein R_1 and R_2 together is tetramethylene or pentamethylene; B_1 and B_2 are the same and each is hydrogen, glycidyl, or β-methylglycidyl; X_1 and X_1 are the same and each represents hydrogen or methyl; X_2 and X_2 are the same and each represents hydrogen or methyl; X_3 and X_3 are the same and each represents hydrogen, methyl, ethyl, or phenyl or X_2 and X_3 and X_2 and X_3 together represent trimethylene or tetramethylene.

3,867,386

5-AMINO-2,6-SUBSTITUTED-7H-PYRROLO(2,3-D)PYRIMIDINES AND RELATED COMPOUNDS

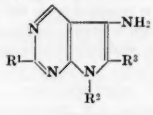
Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 126,265, March 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 874,052, Nov. 4, 1969, Pat. No. 3,631,036. This application July 5, 1973, Ser. No. 376,635

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 F **2 Claims**

1. A compound having the formula:



where

R^1 is lower alkyl, phenyl halophenyl, lower alkylphenyl, lower alkoxyphenyl, or lower alkythio;

R^2 is hydrogen, lower alkyl, or cycloheptylcarbamoylmethyl; and

R^3 is cyano, carbamoyl, or lower alkoxycarbonyl.

3,867,387

2-ALKYL-4-SUBSTITUTED AMINO-QUINAZOLINES AND NITRATES THEREOF

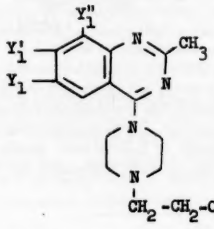
William R. Simpson, Mendham, N.J., assignor to Sandoz-Warner, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 212,784, Dec. 27, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,545

Int. Cl. C07d *51/48*

U.S. Cl. 260—256.4 Q **4 Claims**

1. A compound of the formula



wherein each of Y_1, Y_1' and Y_1'' is alkoxy of 1 to 3 carbon atoms.

3,867,388

3[4-(2-THIENOYL)-PIPERAZINO]-4,5-DIHYDRO-1H-2,4-ENZODIAZEPINES

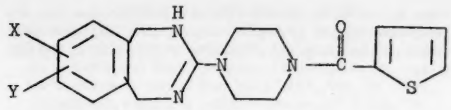
Richard A. Schnettler, 6234 W. Donges Ln., Brown Deer, Wis. 53223, and John T. Suh, 3709 W. Scenic Dr., 111 N. Mequon, Wis. 53092

Filed Dec. 22, 1972, Ser. No. 317,799

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 BC **2 Claims**

1. A compound selected from a compound of the formula:



and pharmaceutically acceptable salts thereof, in which X and Y are hydrogen, hydroxy, halogen, CF_3 or lower alkoxy of 1 to 4 carbon atoms.

3,867,389

ALPHA-(N-BENZOYLOXY AND PHENYLAMINO ALKYL-PIPERAZINO)-BETA-BENZOYL-PROPIONIC ACID DERIVATIVES

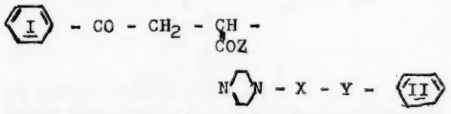
Thomas Raabe, Heusenstamm uber Offenbach, Germany; Aldolf Stachel, deceased, late of Offenbach, Germany (by Ingeburg Lydia Katharina Stachel, heiress); Josef Scholtholt, Frankfurt am (Main)-Fechenheim, and Rolf-Eberhard Nitz, Bergen-Enkheim, both of Germany, assignors to Cassela Farbwerke Mainkur Aktiengesellschaft, Frankfurt (Main), Germany

Division of Ser. No. 239,359, March 29, 1972,. This application May 11, 1973, Ser. No. 359,440

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R **5 Claims**

1. A compound of the formula



wherein Z stands for a member selected from the group consisting of —OH, $-NH_2$ and —ONa, X stands for alkylene with 1 – 4 carbon atoms, Y stands for a member selected from the group consisting of —O—CO— and —CO—NH—, the nucleus I being selected from the group consisting of phenyl and mono-, di- and tri-methoxyphenyl, and nucleus II being selected from the group consisting of phenyl and mono-, di- and tri-methoxyphenyl, and the pharmaceutically acceptable acid addition salts of said compounds.

3,867,390

2 AND 3-SUBSTITUTED-4-(HETEROCYCLIC-AMINO-SULFONYL)BENZENE SULFONAMIDES

Peter Edward Cross, and Brian Gadsby, both of Canterbury, Kent, England, assignors to Pfizer Inc., New York, N.Y.

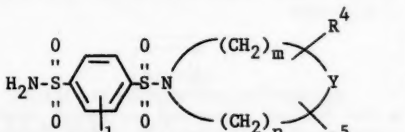
Filed Aug. 9, 1973, Ser. No. 386,854

Claims priority, application Great Britain, Aug. 12, 1972, 37720/72

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.73 **10 Claims**

1. A compound selected from the group consisting of



and the salts thereof with pharmaceutically acceptable cations wherein R^1 is 3-trifluoromethyl, chloro, bromo or fluoro; *n* and *m* are each 2 or 3; Y is methylene; R^4, when taken separately, is hydroxy or alkoxy having 1 to 4 carbon atoms; R^5, when taken separately, is hydrogen, hydroxy or alkoxy having 1 to 4 carbon atoms; and R^4 and R^5, when taken together, are oxo, each oxygen atom in R^4 and R^5, when taken separately, and in R^4 and R^5, when taken together, being separated from the nitrogen atom of the heterocyclic ring by two or more carbon atoms.

3,867,391

CYCLIC N-SUBSTITUTED DERIVATIVES OF 1,4-BENZENE DISULPHONAMIDE

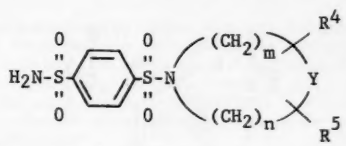
Gerald F. Holland, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 386,853

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.73 **8 Claims**

1. A compound selected from the group consisting of



and the salts thereof with pharmaceutically acceptable cations wherein *n* and *m* are each 2 or 3; Y is methylene or a single bond; R^4, when taken separately, is hydroxy or alkoxy having 1 to 5 carbon atoms; R^5, when taken separately, is hydrogen, hydroxy or alkoxy having 1 to 5 carbon atoms; and R^4 and R^5, when taken together, are oxo, each oxygen atom in R^4 and R^5, when taken separately, and in R^4 and R^5, when taken together, being separated from the nitrogen atom of the heterocyclic ring by two or more carbon atoms.

3,867,392

HYDROXY-PYRIDONE-MONOSULFONIC ACIDS

Ernst Heinrich, Frankfurt(Main)-Fechenheim, and Rolf Muller, Frankfurt(Main), both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt, Germany

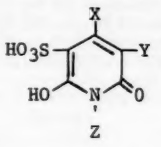
Filed Apr. 6, 1972, Ser. No. 241,845

Claims priority, application Germany, Apr. 10, 1971, 2117753

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8 R **6 Claims**

1. Hydroxy-pyridone-monosulfonic acids of the fomrula



and the tautomers thereof wherein X is alkyl having 1 to 6 carbon atoms; substituted alkyl wherein the alkyl moiety has from 1 to 6 carbon atoms and said substituent is selected from the group consisting of hydroxy and methoxy; cyclohexyl or substituted cyclohexyl wherein said cyclohexyl substituent is selected from the group consisting of chloro, methyl and methoxy; Y is hydrogen; alkyl having 1 to 6 carbon atoms; substituted alkyl wherein the alkyl moiety has from 1 to 6 carbon atoms and said substituent is selected from the group consisting of hydroxy and methoxy; cyclohexyl; substituted cyclohexyl wherein said substituent is selected from the group consisting of chloro, methyl and methoxy or -COR wherein R is methoxymethyl, cyclohexyl or alkyl having 1 to 2 carbon atoms and Z is hydrogen; alkyl having 1 to 6 carbon atoms; substituted alkyl wherein the alkyl moiety has from 1 to 6 carbon atoms and said substituent is selected from the group consisting of hydroxy and methoxy; cyclohexyl and substi-

tuted cyclohexyl wherein the substituent is selected from the group consisting of chloro, methyl and methoxy.

3,867,393

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert; Wulf Vater, and Kurt Stoepel, all of c/o Bayer Aktiengesellschaft, Wuppertal-Elberfeld, Germany

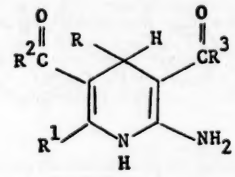
Filed Feb. 28, 1973, Ser. No. 336,639

Claims priority, application Germany, Mar. 6, 1972, 2210674

Int. Cl. C07d *31/36, 31/46*

U.S. Cl. 260—294.9 **35 Claims**

1. A compound of the formula



wherein

R is phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio or phenyl; or naphthyl;

R^1 is hydrogen, lower alkyl, phenyl;

R^2 is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy or lower alkynyloxy; and

R^3 is lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy or lower alkynyloxy.

3,867,394

IMIDAZOLINYL PHENYL CARBONYL COMPOUNDS, ACID ADDITION SALTS AND RELATED COMPOUNDS

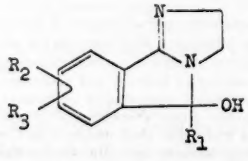
Theodore S. Sulkowski, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 757,792, Sept. 5, 1968, Pat. No. 3,763,178, which is a continuation-in-part of Ser. Nos. 622,918, March 14, 1967, abandoned, and Ser. No. 622,931, March 14, 1967, abandoned, and Ser. No. 576,833, Sept. 2, 1966, abandoned, and Ser. No. 487,587, Sept. 15, 1965, abandoned. This application Sept. 6, 1973, Ser. No. 394,706

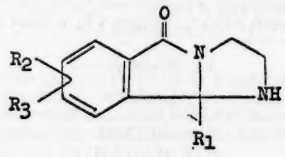
Int. Cl. C07d *49/34, 57/02*

U.S. Cl. 260—296 T **2 Claims**

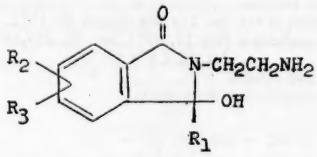
1. A process for the production of a compound having the formula:



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phen(lower)alkyl, monohalophenyl, dihalophenyl, mono(lower)alkylphenyl), di(lower) alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl, di(lower)alkoxyphenyl, thienyl, pyridyl, furyl and tetrahydro-2-naphthyl; R_2 is selected from the group consisting of hydrogen, halogen, amino, lower alkylamino, lower alkyl and lower alkoxy; and R_3 is hydrogen when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy, which comprises contacting a compound of the formula:



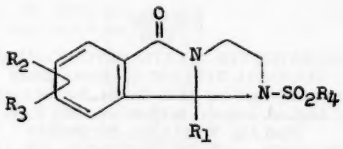
wherein R_1, R_2 and R_3 are defined as above, with a mineral acid, to form the mineral acid addition salt of a phthalimidine of the formula:



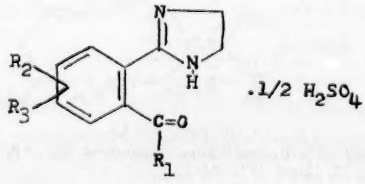
wherein R_1, R_2 and R_3 are defined as above, reacting said phthalimidine acid addition salt with a sulfonyl halide selected from the group consisting of those having the formula:

$$R_4SO_2X$$

wherein R_4 is selected from the group consisting of lower alkyl, phenyl, monohalophenyl, dihalophenyl, mono(lower) alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl and di(lower)alkoxyphenyl and X is halogen, in pyridine at a temperature that is in the range from about 80°C. to about 115°C. for a period from about 2 hours to about 10 hours, to form a compound of the formula:



wherein R_1, R_2, R_3 and R_4 are defined as above, and hydrolyzing said sulfonylimidazoisoindolone by treatment with from about 80 to about 100 percent sulfuric acid, to form a sulfate of the formula:



wherein R_1, R_2 and R_3 are defined as above, and then contacting said sulfate with a base.

3,867,395

1,2,4-4H-TRIAZOLE DERIVATIVES

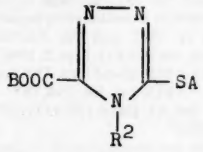
Michael C. Seidel, Levittown; William C. Von Meyer, Willow Grove, and Stanley A. Greenfield, Ambler, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 67,198, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 847,481, July 3, 1969, Pat. No. 3,701,784, which is a continuation-in-part of Ser. No. 757,490, Sept. 4, 1968, Pat. No. 3,769,411. This application June 8, 1972, Ser. No. 263,728

Int. Cl. C07d *55/06*

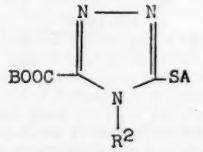
U.S. Cl. 260—308 R 6 Claims

1. A compound of the formula



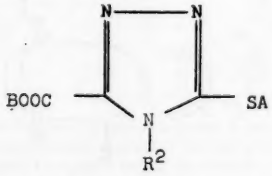
hydrogen, alkyl of 1 to 5 carbon atoms, an alkali metal ion, ammonium monosubstituted with lower alkyl or lower hydroxyalkyl, ammonium disubstituted with lower alkyl or lower hydroxyalkyl or ammonium trisubstituted with lower alkyl or lower hydroxyalkyl.

2. A compound of the formula



wherein R^2 is alkyl, straight or branched, of 1 to 12 carbon atoms; A is the $-C(O)NHCH_3$ group; and B is hydrogen, alkyl of 1 to 5 carbon atoms, an alkali metal ion, ammonium monosubstituted with lower alkyl or lower hydroxyalkyl, ammonium disubstituted with lower alkyl or lower hydroxyalkyl or ammonium trisubstituted with lower alkyl or lower hydroxyalkyl.

3. A compound of the formula



wherein R^2 is alkyl, straight or branched, of 2 to 6 carbon atoms; A is hydrogen; and B is the tri(ethanol)ammonium group.

3,867,396

TRIAZOLYL PHOSPHORUS COMPOUNDS

Dag Dawes, Pratteln, and Beat Bohner, Binningen, both of Switzerland, assignors to Ciba-Giegy Corporation, Ardsley, N.Y.

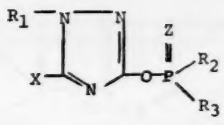
Filed Nov. 29, 1972, Ser. No. 310,530

Claims priority, application Switzerland, Dec. 10, 1971, 18065/71; Oct. 6, 1972, 14693/72

Int. Cl. C07d *55/06*

U.S. Cl. 260—308 R 7 Claims

1. A compound of the formula



wherein X represents fluorine, chlorine or bromine; Z represents oxygen or sulphur; R_1 represents C_1—C_{19} alkyl, C_3—C_8 cycloalkyl, or phenyl, benzyl, phenethyl, diphenylmethyl or

optionally substituted by halogen, nitro, alkyl, halogenoalkyl, alkoxy, alkylsulphinyl or alkylsulphonyl, the alkyl groups of which each have 1–6 carbon atoms; R_2 represents C_1—C_{19} alkoxy, C_1—C_{19} alkylthio, amino, mono- or di(C_1—C_{19})alkylamino; and R_3 represents C_1—C_{19} alkyl, C_1—C_{19} alkoxy, C_1—C_{19} alkylthio, phenyl, phenoxy, amino, mono- or di(C_1—C_{19})alkylamino.

3,867,397

TRIAZOLYL PHOSPHORUS COMPOUNDS

Beat Bohner, Binningen; Dag Dawes, Pratteln, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

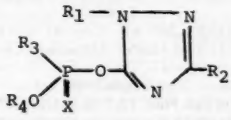
Filed Nov. 30, 1972, Ser. No. 310,727

Claims priority, application Switzerland, Dec. 10, 1971, 18064/71; Sept. 29, 1972, 14253/72

Int. Cl. C07d *55/06*

U.S. Cl. 260—308 R 2 Claims

1. A compound of the formula



wherein

R_1 represents C_1–C_5-alkyl, cyclopentyl, cyclohexyl, phenyl, benzyl or phenethyl,

R_2 represents C_1–C_5-alkylthio, C_1–C_5-alkylsulphinyl, C_1–C_5-alkylsulphonyl, phenthio, phenylsulphinyl, phenylsulphonyl, benzylthio, benzosulphinyl or benzylsulphonyl,

R_3 represents C_1–C_5-alkyl, C_1–C_5-alkoxy, C_1–C_5-alkylthio or phenyl,

R_4 represents C_1–C_5-alkyl, and

X represents oxygen or sulphur.

3,867,398

TRIAZOLYL PHOSPHORUS COMPOUNDS

Beat Bohner, Binningen; Dag Dawes, Pratteln, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

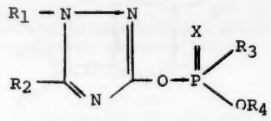
Filed Nov. 30, 1972, Ser. No. 310,728

Claims priority, application Switzerland, Dec. 10, 1971, 18064/71; Sept. 29, 1972, 14254/72

Int. Cl. C07d *55/06*

U.S. Cl. 260—308 R 8 Claims

1. A compound for the formula



(I)

wherein

R_1 represents hydrogen, C_1–C_{12} alkyl, C_3–C_8 cycloalkyl, phenyl, phenyl substituted by methoxy, halogen or C_1–C_5 alkyl, benzyl or phenethyl,

R_2 represents C_1–C_{12} alkylthio, C_1–C_{12} alkylsulphinyl C_1–C_{12} alkylsulphonyl, phenthio, phenylsulphinyl, phenylsulphonyl, benzylthio, benzylsulphinyl or benzylsulphonyl,

R_3 represents C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_1–C_{12} alkylthio or phenyl,

R_4 represents C_1–C_{12} alkyl, and

X represents oxygen or sulphur.

3,867,399

DIBENZIMIDAZOLE-DIUREAS

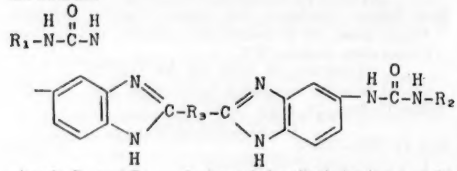
August G. Birke, Godfrey, Ill., assignor to Shell Oil Company, New York, N.Y.

Division of Ser. No. 169,460, Aug. 5, 1971, Pat. No. 3,752,765. This application Aug. 9, 1973, Ser. No. 386,910

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **5 Claims**

1. A dibenzimidazole-diurea compound corresponding to the formula:



wherein R_1 and R_2 are hydrocarbyl radicals having 6 to 30 carbon atoms and R_3 is a hydrocarbylene radical having from 2 to 20 carbon atoms.

3,867,400

PROCESS FOR THE MANUFACTURE OF 1,1-METHYLENE-BIS-(3-(HYDROXYLALKYL)-HYDANTOINS)

Jurgen Habermeier, Pfeffingen, and Hans Batzer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

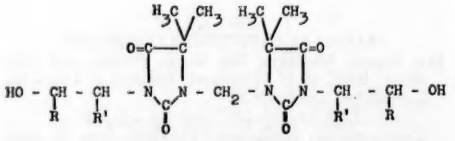
Filed Aug. 9, 1973, Ser. No. 387,061

Claims priority, application Switzerland, Aug. 25, 1972, 12653/72

Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 **3 Claims**

1. In the process for the manufacture of 1,1′-methylene-bis-[3-(2′-hydroxyalkyl-hydantoin] compounds of the formula



wherein R each denote a hydrogen atom, methyl, ethyl or phenyl and R′ denotes a hydrogen atom or, together with R denotes the tetramethylene radical, by catalytic addition reaction of ethylene oxide, propylene oxide, butylene oxide, cyclohexene oxide styrene oxide to 1,1′-methylene-bis-(5,5-dimethylhydantoin) in the presence of neutral or alkaline catalysts the improvement which consists in using as solvents water or 1–60 percent strength aqueous dioxane solution.

3,867,401

IMIDAZOLINYL PHENYL CARBONYL COMPOUNDS, ACID ADDITION SALTS AND RELATED COMPOUNDS

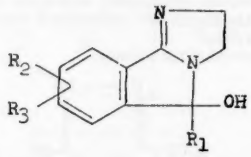
Theodore S. Sulkowski, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 757,792, Sept. 5, 1968, Pat. No. 3,763,178, which is a continuation-in-part of Ser. Nos. 622,918, March 14, 1967, and Ser. No. 622,931, March 14, 1967, and Ser. No. 576,833, Sept. 2, 1966, and Ser. No. 487,587, Sept. 15, 1965, abandoned. This application Sept. 6, 1973, Ser. No. 394,707

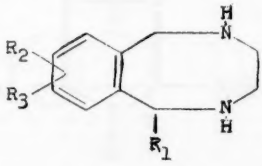
Int. Cl. C07d *49/34*, *57/02*

U.S. Cl. 260—309.6 **4 Claims**

1. A process for the preparation of a compound having the formula:



wherein R_1 is selected from the group consisting of lower alkyl, phenyl, lower alkylphenyl, lower alkoxyphenyl, di(-lower) alkylphenyl, di(lower)alkoxyphenyl, aminophenyl, trifluoromethylphenyl, monohalophenyl, dihalophenyl, furyl, thienyl and naphthyl; R_2 is selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy; R_3 is hydrogen when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy which comprises contacting a benzodiazocine of the formula:



wherein R_1, R_2 and R_3 are defined as above, with an oxidizing agent in a reaction-inert solvent at a temperature from about 20°C. to about 60°C. for a period of about ½hour to about 4 hours.

3,867,402

1-METHYL-4,5-DI(P-METHOXYPHENYL)-6H-PYRROLO(2,3-C) PYRAZOLE

Gerard Yvon Paris, Duvernay, Quebec, Canada, and Leo Ralph Swett, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 15, 1973, Ser. No. 341,444

Int. Cl. C07d *57/02*

U.S. Cl. 260—310 R **1 Claim**

1. The compound, 1-methyl-4,5-di(p-methoxyphenyl)-6H-pyrrolo[2,3-c]pyrazole.

3,867,403

1,2-DIALKYL-3,5-DIPHENYLPYRAZOLIUM SALTS

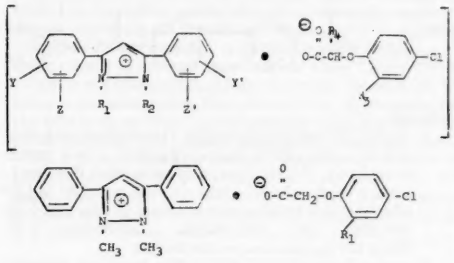
Richard William Feeny, Hightstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 17, 1972, Ser. No. 307,670

Int. Cl. C07d 49/18

U.S. Cl. 260—311 3 Claims

1. A compound of the formula:



wherein R_1 is methyl or Cl.

3,867,404

NEW ISOINDOLINONE PIGMENTS AND PROCESS FOR THEIR MANUFACTURE

Jost von der Crone, Riehen; Ernst Model, Basle, and Andre Pugin, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

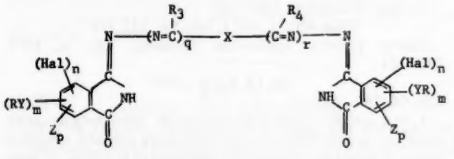
Filed Jan. 15, 1978, Ser. No. 323,685

Claims priority, application Switzerland, Jan. 17, 1972, 618/72

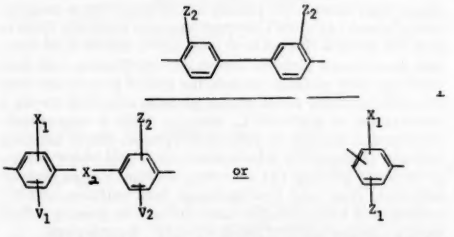
Int. Cl. C07d 27/50

U.S. Cl. 260—325 PH 10 Claims

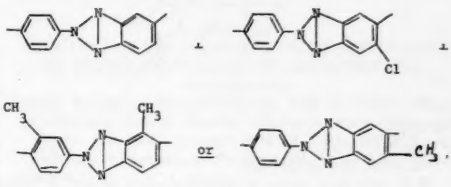
1. An isoindolinone pigment of the formula



wherein Hal denotes chlorine or bromine, X denotes a direct bond, a carbocyclic radical selected from the group consisting of naphthylene, or a group having the formula



wherein X_1, V_1, V_2 and Z_2 denote hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, X_2 denotes sulphur, —NH—CO—, —NH—CO—NH—, —CH=CH—or —N=N—, Z_1 is halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenylazo, phenylazo substituted with methyl or acetylamino, or a heterocyclic aromatic radical, selected from the group consisting of



Y denotes oxygen or sulphur, R_3 and R_4 denote hydrogen, lower alkyl or an aryl radical selected from the group consisting of chlorophenyl, or dichlorophenyl, and R denotes hydrogen, lower alkyl, lower cycloalkyl, benzyl or aryl selected from the group consisting of phenyl, chlorophenyl, methylphenyl, dichlorophenyl, dimethyl-phenyl, methoxyphenyl or naphthyl, Z denotes hydorgen, n denotes the number 0 to 3, m denotes the number 1 to 4, p denotes the number 0 to 2 and q and r denote the numbers 0 or 1, with the sum of $n+m+p$ being at most 4.

3,867,405

PROCESS FOR PREPARING N-(BETA-HYDROXYETHYL)-2-PYRROLIDONE

Junichi Kanetka, and Takashi Shimodaira, both of Ami-machi, Japan, assignors to Mitsubishi Petrochemimcal Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1973, Ser. No. 336,774

Claims priority, application Japan, Mar. 17, 1972, 47-27150

Int. Cl. C07d 27/08

U.S. Cl. 260—326.5 FL 7 Claims

1. In a process for preparing N-(β-hydroxyethyl)-2-pyrrolidone by reacting γ-butyrolactone with monoethanolamine at a temperature of 150° – 400°C under a pressure which is at least the pressure of water at the reaction temperature selected, the improvement which comprises:

adding water to the condensation reaction system, in an amount of more than about 3 percent by weight based on the total weight of γ-butyrolactone and monoethanolamine.

3,867,406

ANTHRAQUINOID DISPERSE DYES

Gerd Schwantje, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Germany

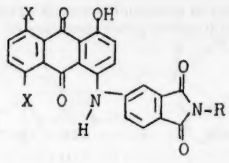
Filed June 4, 1973, Ser. No. 366,498

Claims priority, application Germany, June 6, 1972, 2227401

Int. Cl. C07d 27/00, 27/52

U.S. Cl. 260—326 D 16 Claims

1. An anthraquinoid dye of the formula:



in which
one X is hydroxyl;
the other X is amino; and
R is hydrogen, linear or branched alkyl of one to eight carbon atoms, hydroxyalkyl of two to six carbon atoms, alkoxyalkyl of a total of three to six carbon atoms, β-carbalkoxyethyl of a total of four to seven carbon atoms, β-(β′-hydroxyethoxy)-ethyl, β-(carbo-β′-hydroxyethoxy)-ethyl, cyclohexyl, or phenyl.

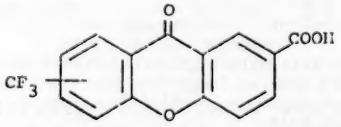
3,867,407

SUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

Jurg R. Pfister; Ian T. Harrison, and John H. Fried, all of Syntex Research, 3401 Hillview Ave., Palo Alto, Calif. 94304

Continuation-in-part of Ser. No. 174,260, Aug. 23, 1971, abandoned. This application Dec. 14, 1973, Ser. No. 424,695
Int. Cl. C07d *7/44*
U.S. Cl. 260—335 **6 Claims**

1. A compound selected from those represented by the following formula:



and the pharmaceutically acceptable, non-toxic lower alkyl esters, unsubstituted, mono(lower)alkyl, or di(lower)alkyl substituted amides and salts thereof.

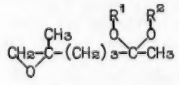
3,867,408

1,2-EPOXY-2-METHYL-6-HEPTANONE KETALS

Hans K. Dietl, and Kent C. Brannock, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 23, 1972, Ser. No. 283,111
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 **5 Claims**

1. A ketal having the formula



wherein
R^1 and R^2 are the same or different alkyl having 1 to 10 carbon atoms, cycloalkyl having 5 to 7 carbon ring structure or phenyl one carbon atom of which has an alkyl having 1 to 5 carbon atoms; or
R^1 and R^2 taken together are —A— wherein —A— is alkylene having 2 to 4 carbon atoms or alkylene having 2 to 4 carbon atoms substituted with alkyl having 1 to 5 carbon atoms, cycloalkyl having a 5–7 carbon ring structure or phenyl one carbon of which is substituted with alkyl having 1 to 5 carbon atoms.

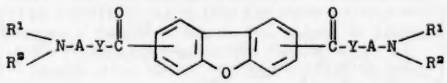
3,867,409

BIS-BASIC ESTERS OF DIBENZOFURAN

William L. Albrecht, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell, Inc., New York, N.Y.

Filed June 16, 1969, Ser. No. 833,717
Int. Cl. C07c *5/42*
U.S. Cl. 260—346.2 M **5 Claims**

1. A compound of the formula



wherein
A. each of R^1 and R^2 is hydrogen, (lower)alkyl, cycloalkyl of 3 to 6 ring carbon atoms, alkenyl of 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position of the alkenyl group, or each set of R^1 and R^2 taken together with the nitrogen atom to which they are attached is pyrrolidino, piperidino, N-(lower)alkylpiperazino, or morpholino;
B. each A is alkylene of 3 to 8 carbon atoms and separates its adjacent Y and amino nitrogen by an alkylene chain of at least 3 carbon atoms;
C. each Y is oxygen, or a pharmaceutically acceptable acid addition salt thereof.

3,867,410

CLEANING OF THE LOWER FINNED TUBES IN THE SEPARATION OF PHTHALIC ANHYDRIDE

Erich Brand, Braunsfeld, and Helmut Saffran, Cologne, both of Germany, assignors to Chemiebau Dr. A. zieren GmbH & Co. kg., Braunsfeld, Germany

Filed Apr. 5, 1971, Ser. No. 131,371
Claims priority, application Germany, Apr. 6, 1970, 2016302
Int. Cl. C07c *63/18*
U.S. Cl. 260—346.4 **8 Claims**

1. In a cyclical process for recovering solid phthalic anhydride in a separator from a gas containing phthalic anhydride vapor obtained by catalytic air oxidation of o-xylene or naphthalene in contact with a V_2O_5 containing catalyst, comprising continuously repeating in sequence the steps of: (a) passing said gas containing phthalic anhydride vapor over a plurality of rows of cooled heat exchange tubes superimposed on one another in a housing to precipitate solid phthalic anhydride on the surfaces thereof; (b) passing a hot fluid having a temperature of about 145°–190°C through said heat exchange tubes to heat the surfaces thereof to at least 130°C and melt off resultant precipitated phthalic anhydride; (c) flushing said heat exchange tube surfaces towards the end of at least one step (b) with externally added molten phthalic anhydride having a temperature of 130°–280°C, whereby there is substantially prevented a buildup in difficult-to-remove, firmly adhering deposits of impurities which otherwise would cause a shutdown in the process; (d) collecting resultant molten phthalic anhydride from said heat exchange tube surfaces; and (e) cooling said heat exchange tube surfaces by passing a fluid having a temperature of about 45°–55°C therethrough;
the improvement comprising: forming a pool of molten phthalic anhydride in the bottom of said housing below said heat exchange tubes and flushing said heat exchange surfaces with molten phthalic anhydride from said pool at a point above the lower rows of tubes.

3,867,411

P-V-FE CATALYST MODIFIED WITH CHROMIUM FOR PRODUCTION OF MALEIC ANHYDRIDE FROM SATURATED ALIPHATIC HYDROCARBONS

Harold Raffelson, and Michael Suda, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1971, Ser. No. 212,792

Int. Cl. C07c *57/14*

U.S. Cl. 260—346.8 A **6 Claims**

1. In a process for producing maleic anhydride by the catalytic oxidation of a saturated aliphatic hydrocarbon having from 4 to 10 carbon atoms, wherein a stream of oxygen or oxygen-containing gas containing from about 0.5 to about 10 mole percent hydrocarbon is passed over the catalyst at a space velocity of between about 200 and about 7,000 reciprocal hours at a temperature of from about 400° to about 600°C. under a pressure ranging from about 0.5 to 10 atmospheres, the improvement which comprises conducting said oxidation in the presence of a catalyst comprising phosphorus, vanadium, iron, oxygen and chromium, wherein the atomic ratio of phosphorus to vanadium is from about 1:1 to about 15:1, the atomic ratio of iron to vanadium is from about 0.2:1 to about 6:1, and the chromium is present in the range of from about 2 to about 20 atomic percent of the active metals.

3,867,412

METHOD OF OXIDIZING BENZENE TO MALEIC ANHYDRIDE USING A VANADIUM, MOLYBDENUM, BORON CONTAINING CATALYST

Robert S. Barker, Little Ferry, N.J., assignor to Halcon International, Inc., New York, N.Y.

Division of Ser. No. 76,249, Sept. 28, 1970, Pat. No. 3,759,840. This application Dec. 27, 1972, Ser. No. 318,941

Int. Cl. C07c *57/14*

U.S. Cl. 260—346.8 A **4 Claims**

1. A process for the preparation of maleic anhydride which comprises oxidizing benzene in the vapor-phase with molecular oxygen in the presence of a catalyst consisting essentially of oxides of vanadium, molybdenum and boron, and an oxide of at least one member of the group consisting of phosphorus, cobalt, nickel, iron and sodium, the relative amounts of said oxides, expressed as V, Mo, B, P, Co, Ni, Fe and Na being, per mol of V, 0.1 to 0.95 mol Mo, 0.005 to 0.3 mol B, up to 0.5 mol P, up to 0.05 mol Co, up to 0.05 mol Ni, up to 0.05 mol Fe and up to 0.6 mol Na.

3,867,413

FUSIDIC ACID CONJUGATES

Welf Von Daehne, Rungsted, and Wagn Ole Godtfredsen, Vaerlose, both of Denmark, assignors to Lee Pharmaceutical Products Ltd. A/S. Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

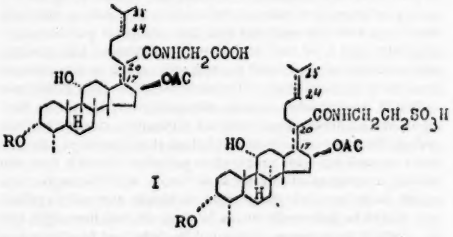
Filed Sept. 24, 1973, Ser. No. 400,348

Claims priority, application Great Britain, Oct. 6, 1972, 46351/72; Aug. 30, 1973, 40981/73

Int. Cl. C07c *169/60*

U.S. Cl. 260—397.1 **6 Claims**

1. Compounds represented by the following formulae:



I II

in which OAc indicates $OOC.CH_3$ the dotted lines between C-17 and C-20 and between C-24 and C-25 indicate that the carbon atoms in question are connected with either a single bond or a double bond, and R is hydrogen or an acetyl group, and their salts with pharmaceutically acceptable bases.

3,867,414

PROCESS FOR THE PREPARATION OF SUSPENSIONS OF MICROCRYSTALS OF CHLORAMPHENICOL PALMITATE

Masuo Murakami; Ryuichi Kawata, both of Tokyo; Shigeo Kawamura, Urawa; Shuichi Takamura, Ageo; Takayoshi Hirano, and Kouji Tomuro, both of Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 90,822, Nov. 18, 1970, abandoned. This application Apr. 6, 1973, Ser. No. 348,667

Claims priority, application Japan, Dec. 6, 1969, 44-97310

Int. Cl. A61k *21/00*

U.S. Cl. 260—404.5 **5 Claims**

1. A process for the preparation of a microcrystalline chloramphenicol palmitate suspension comprising mix-melting 100 parts of chloramphenicol palmitate and 3–10 parts by weight, based on said chloramphenicol palmitate, of a nonionic surface active agent having an HLB value between 13.0 and 16.5 selected from the group consisting of a polyoxyethylene (n=15–30) higher fatty acid (C_{12}–C_{18}) ester, a polyoxyethylene (n=10–25) sorbitan higher fatty acid (C_{12}–C_{18}) ester, a polyoxyethylene (n=10–20) polyoxypropylene (m=1–4) higher alcohol (C_{12}–C_{18}) ether, a polyoxyethylene (n=15–30) alkyl (C_8–C_{10}) aryl ether, and a polyoxyethylene (n=50–80) hydrogenated castor oil, solidifying the molten mixture by cooling, dispersing the solidified mixture in a liquid suspension medium selected from the group consisting of water, an aqueous solution of sodium carboxymethyl cellulose and an aqueous solution of methyl cellulose, and reducing the particle size of the resulting crystalline chloramphenicol palmitate product to less than 0.5 microns.

3,867,415

PROPENYL AND PROPYNYL ESTERS OF CHLORO SUBSTITUTED 2-OCTENOIC AND 2-NONENOIC ACIDS

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 15, 1972, Ser. No. 235,030

Claims priority, application Switzerland, Mar. 24, 1971, 4335/71

Int. Cl. C07c *69/62;* **A01n** *9/24*

U.S. Cl. 260—408 **5 Claims**

1. 7-chloro-3,7-dimethyl-2-octenoic acid propynyl ester.

3,867,416

CONTINUOUS PROCESS FOR DRYING AND EXTRACTING OILS FROM SOLID MATERIALS

Roy W. Barns, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Continuation-in-part of Ser. No. 565,434, July 15, 1966, abandoned. This application Dec. 31, 1969, Ser. No. 889,712

Int. Cl. C11b *1/10*

U.S. Cl. 260—412.8 **8 Claims**

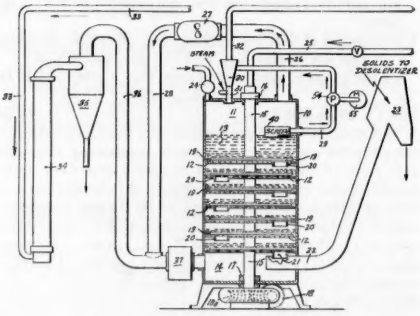
1. A continuous dehydration and oil extraction process, comprising the steps of:

a. supplying finely-divided oil-bearing solid particulate material into the top of an extractor column having a plurality of successive, vertically spaced plates severally provided with a plurality of openings therethrough, said plates supporting said material in a series of vertically spaced beds,

b. introducing extraction solvent vapor into the bottom of said extractor column to pass upwardly through said

openings and beds to act upon said material and to pass out of the top of said extractor column, and

c. controlling such introduction of said extraction solvent vapor so that the velocity of same rising through said extractor column is held in a range sufficient to separate individual solid particles of material in said beds to provide random particle movement throughout each of said beds, to carry liquids up through the successive beds of



material to form a pool of miscella above the top bed of material, and to permit limited settling of said material downwardly from bed to bed through at least one of said openings through each of said plates, whereby the particles travel downwardly at a controlled rate while being subjected to the drying and extraction effect of said solvent vapor in its upward passage through said extractor column.

3,867,417

VANADYL XANTHATES

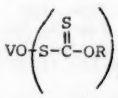
William K. T. Gleim, Island Lake, and Elmars Bremanis, Park Ridge, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 20, 1973, Ser. No. 353,047

Int. Cl. C07f 9/00

U.S. Cl. 260—429 K **6 Claims**

1. A process for the preparation of a vanadyl xanthate having the following formula:



in which R is selected from the group consisting of methyl, ethyl, propyl, butyl, amyl, hexyl, heptyl, octyl, nonyl, decyl, cyclohexyl and benzyl radicals which comprises reacting an alkali xanthate wherein the xanthate moiety is selected from the group consisting of ethyl, propyl, butyl, amyl, hexyl, hephyl, octyl, nonyl, decyl, cyclohexyl and benzyl xanthate with a vanadyl salt in an oxygen-free atmosphere of carbon dioxide at reaction conditions and recovering the resulting vanadyl xanthate.

3,867,418

EUROPIUM COMPLEX OF 1,1,1,2,2,6,6,7,7,7-DECAFLUORO-3,5-HEPTANEDIONE

Charles A. Burgett, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 253,986, May 17, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 416,751

Int. Cl. C07f 5/00

U.S. Cl. 260—429.2 **1 Claim**

1. A paramagnetic shift reagent, consisting of the europium (Eu) complex of 1,1,1,2,2,6,6,7,7,7-decafluoro-3,5-heptanedione [H(FHD)], said complex having the general formula $Eu(FHD)_3$.

3,867,419

PROCESS FOR THE PREPARATION OF AN AQUEOUS SOLUTION OF AN IRON (III)-AMINOPOLYCARBOXYLIC ACID COMPLEX COMPOUND

Haruhiko Iwano, and Sachio Matsushita, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 29, 1973, Ser. No. 375,238

Claims priority, application Japan, July 28, 1972, 47-75761

Int. Cl. C07f 15/02

U.S. Cl. 260—439 R **15 Claims**

1. A process for the preparation of an aqueous solution of iron(III)-aminopolycarboxylic acid complex compound characterized by mixing an aminopolycarboxylic acid capable of forming a chelate with a ferric ion or a salt thereof and metallic iron in an aqueous medium and reacting the mixture with oxygen in the presence of a water soluble iron salt.

3,867,420

PARTIALLY CROSSLINKED SILOXANE-POLYOXYALKYLENE (SIOC) BLOCK COPOLYMER COMPOSITIONS AND USE THEREOF AS SURFACTANTS IN THE PRODUCTION OF POLYURETHANE FOAMS

Edward L. Morehouse, New City, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 82,171

Int. Cl. C07f 7/18

U.S. Cl. 260—448.8 R **8 Claims**

1. Composition consisting essentially of partially crosslinked siloxane-polyoxyalkylene block copolymers wherein the polyoxyalkylene blocks are linked to the siloxane blocks by silicon to oxygen to carbon linkages, the carbon of each said linkage being bonded only to the oxygen of said linkage, hydrogen and carbon, the siloxane blocks are comprised of siloxane units each having one to three monovalent hydrocarbon groups having from 1 to 18 carbon atoms bonded to the silicon thereof and have an average of at least two valences of silicon per siloxane blocks combined in said linkages, a portion of said polyoxyalkylene blocks are crosslinking blocks having at least two valences of carbon per polyoxyalkylene block combined in said linkages and comprise polyoxyalkylene units, and a portion of said polyoxyalkylene blocks comprise oxyalkylene units and contain at least one group selected from the class consisting of hydroxy, —OR, —OOCNHR, and —OOCR groups wherein R is monovalent hydrocarbon having 1 to 18 carbon atoms free of aliphatic unsaturation, the average number of said silicon valences per average siloxane block combined with said polyoxyalkylene blocks time the weight percentage of said siloxane blocks in said composition, based on the total weight of siloxane blocks and polyoxyalkylene blocks in the composition, is about 20 to about 150, and the ratio of the number of said polyoxyalkylene blocks to said siloxane blocks is about 3:1 to about 100:1.

3,867,421
BIODEGRADABLE SULFATE DETERGENTS

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 3, 1972, Ser. No. 277,836
Int. Cl. C07c *141/12*
U.S. Cl. 260—457 4 Claims

1. A process for the preparation of a biodegradable detergent which comprises the steps of:

a. condensing butadiene with allyl alcohol in a Diels-Alder reaction at a temperature of from about 50° to about 190°C. and a pressure of from about atmospheric to about 100 atmospheres to form hydroxymethylcyclohexene;

b. catalytically hydrogenating said hydroxymethylcyclohexene at a hydrogenating temperature of from about −25° to about 100°C. and a hydrogen pressure of from about 50 to about 2,000 pounds per square inch to form hydroxymethycyclohexane;

c. ring alkylating said hydroxymethylcyclohexane with a 1-alkene in the presence of an organic peroxy free radical catalyst and hydrogen chloride at a temperature in the range of from about 50° to about 300° and at least as high as the decomposition temperature of said peroxy catalyst to form n-alkyl substituted hydroxymethycyclohexane;

d. sulfating said n-alkyl substituted hydroxymethylcyclohexane with a sulfating agent selected from the group consisting of sulfuric acid and sulfur trioxide present in an amount of about 1.01 to about 1.1 moles of sulfating agent per mole of alkyl substituted hydroxymethylcyclohexane at a temperature of from about 0° to about 60°C. to form the sulfate ester thereof; and

e. neutralizing said ester with a neutralizing agent selected from the group consisting of alkali metal base, alkaline earth metal base, ammonia, ammonium hydroxide, lower alkyl- and alkanol-amine, and benzyl amine to form the resultant biodegradable detergent.

3,867,422
PROCESS FOR THE PURIFICATION AND STABILIZATION OF MALONODINITRILE

Werner Heimberger, Hanau; Hermann Schmitt, Rodenbach; Gerd Schreyer; Ferdinand Theissen, both of Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt (Main), Germany

Filed Dec. 7, 1973, Ser. No. 422,738
Claims priority, application Germany, Dec. 8, 1972, 2260126
Int. Cl. C07c *121/20*, *121/22*
U.S. Cl. 260—465.8 R 12 Claims

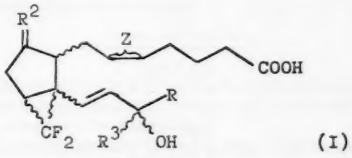
1. A process for the purification and stabilization of impure malonodinitrile prepared from a cyanogen halide selected from the group consisting of cyanogen chloride and cyanogen bromide and acetonitrile and which contains fumarodinitrile comprising providing benzonitrile in an amount sufficient to prevent the discolorizing effects of fumarodinitrile, said amount being 0.01 to 5 parts of benzonitrile per part of fumarodinitrile in the impure malonodinitrile and crystallizing said impure malonodinitrile from a solvent which is an alkanol or dialkyl ether which is liquid at a temperature of 0°C. and boils at a temperature below the boiling point of malonodinitrile.

3,867,423
DIFLUOROMETHYLENE SUBSTITUTED PROSTAGLANDIN DERIVATIVES

Pierre Crabbe, Grenoble, France, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 287,333, Sept. 8, 1972, abandoned. This application July 13, 1973, Ser. No. 379,127
Int. Cl. C07c *61/32*, *61/36*, *61/74*
U.S. Cl. 260—468 D 127 Claims

1. A compound selected from the group of antimers and racemic mixtures thereof of the formula:



(I)

wherein

R represents alkyl of three through nine carbon atoms;

R^2 represents a keto group or the grouping

and

R^3 represents hydrogen, methyl or ethyl;

z represents a single bond or a cis double bond; and

the wavy line ( ) represents the α or β configuration or mixtures thereof, provided that

a. when the side chain attached at the 12-position is β, the difluoromethylene group at the 11,12-position is $11\alpha,12\alpha$ only; and when the side chain attached at the 12 position is α, the difluoromethylene group at the 11,12-position is $11\beta,12\beta$ only; and

b. when R^3 is α the hydroxyl group, attached to the same carbon as R^3, is β; and when R^3 is β the hydroxyl group, attached to the same carbon as R^3, is α; and the pharmaceutically acceptable salts or methyl esters thereof.

3,867,424
METHOD FOR PREPARING ACYLATED PRODUCTS

Yasuo Fujimoto, and Nobuhiro Nakamizo, both of Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed June 25, 1970, Ser. No. 49,918
Claims priority, application Japan, June 30, 1969, 44-51061
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C 4 Claims

1. In the process for preparing a carboxylic acid amide wherein a primary or secondary amine selected from alkylamines, arylamines and substituted arylamines is acylated with an ester derived from aliphatic or aromatic carboxylic acid, the improvement which comprises carrying out said acylation in the presence of an alkali-metal salt, an alkaline earth metal salt of a quaternary ammonium salt of a compound containing a pyridine nucleus directly substituted by a hydroxy group, a mercapto group, or a group selected from alkyl groups having 1 to 6 carbon atoms, aryl groups, aralkyl groups, alkoxy groups having 1 to 6 carbon atoms, nitro groups, and cyano groups.

3,867,425

SUBSTITUTED BENZYL CARBAZIC ACID ESTERS

John Paul Dusza, Nanuet; Harry Lee Dindsay; Ralph Grassing Child, both of Pearl River, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 9, 1974, Ser. No. 432,103
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C 2 Claims

1. The compound 3-(α-ethylveratrylidene)-carbazic acid ethyl ester.

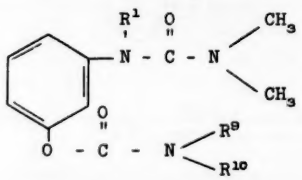
3,867,426

HERBICIDAL META-BIFUNCTIONAL BENZENES

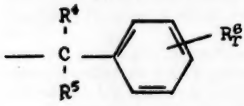
John F. Olin, Ballwin, and Philip C. Hamm, Glendale, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 2, 1970, Ser. No. 77,677
Int. Cl. C07c *127/20*
U.S. Cl. 260—472 7 Claims

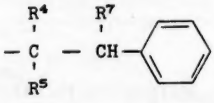
1. Meta-bifunctional substituted benzenes of the formula



wherein R^1 is hydrogen or alkyl having a maximum of 4 carbon atoms, R^9 is selected from the group consisting of $-CH_2CH_2-O-$phenyl, $-CH_2CH_2-O-$naphthyl, $-CH_2CH=CH-$phenyl and the group



and



wherein R^4 and R^5 are each independently selected from the group consisting of hydrogen, alkyl having a maximum of 4 carbon atoms, alkenyl having a maximum of 3 carbon atoms, chloroalkyl having a maximum of 3 carbon atoms and a maximum of 3 halogen atoms, chloroalkenyl having a maximum of 3 carbon atoms and 3 halogen atoms, R^6 is selected from the group consisting of halogen, alkyl having a maximum of 4 carbon atoms, chloroalkyl having a maximum of 3 carbon atoms and a maximum of 3 halogen atoms, nitro, and alkoxy having a maximum of 3 carbon atoms; and r is one of the integers zero to three, R^7 is selected from the group consisting of alkyl and alkenyl each having a maximum of 4 carbon atoms and R^{10} is selected from the group consisting of hydrogen, alkyl having a maximum of 12 carbon atoms, cycloalkyl having 5 to 7 ring carbon atoms, chloroalkyl having a maximum of 6 carbon atoms and a maximum of 3 halogen atoms and chloroalkenyl having a maximum of 4 carbon atoms and a maximum of 3 halogen atoms.

3,867,427

PREPARATION OF PHENOLIC CARBOXYLIC ACID ESTERS

Duane B. Priddy, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 11, 1972, Ser. No. 288,094
Int. Cl. C07c *69/78*
U.S. Cl. 260—473 S 6 Claims

1. The process of making an ester of a phenolic carboxylic acid comprising reacting by contacting at about 100°- 225°C. in a polar aprotic solvent selected from the group consisting of dimethylformamide, dimethylsulfoxide and hexamethylphosphoramide under substantially anhydrous conditions an alkali metal phenate having at least one unsubstituted ortho or para position and selected from the group consisting of those derived from phenol, chlorinated phenols, brominated phenols, alkylphenols and phenylphenol with an organic carbonate of the formula ROCOOR′, wherein R and R′ are alkyl or aryl hydrocarbyl radicals.

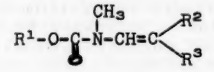
3,867,428

SUBSTITUTED CARBAMATES

Hans Kiefer, Wachenheim; Albrecht Mueller; Karl-Heinz Koenig, both of Frankenthal; Wolfgang Rohr, Mannheim, and Heinrich Adolphi, Limburgerhof, all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Dec. 29, 1971, Ser. No. 213,746
Claims priority, application Germany, Jan. 8, 1971, 2100684
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 C 3 Claims

1. A compound of the formula



wherein:

R^1 is phenyl substituted once by lower alkoxy, lower alkenoxy, or lower alkynoxy;

R^2 is methyl or hydrogen;

R^3 is methyl or hydrogen.

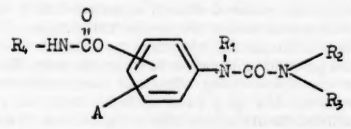
3,867,429

ALKYNYLOXY)ALKYL AND (ALKENYLOXY)ALKYL CARBAMATES

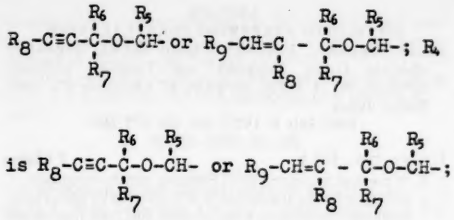
Barrington Cross, Rocky Hill, and Charles Paul Grasso, Cranbury, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 26, 1973, Ser. No. 344,667
Int. Cl. C07c *127/14*, *127/16*, *127/18*
U.S. Cl. 260—479 C 9 Claims

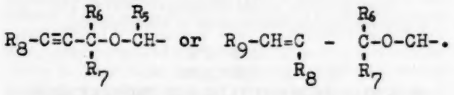
1. A compound having the formula:



wherein R_1 is hydrogen, hydroxyl or alkyl C_1-C_4; R_2 is hydrogen, alkyl C_1-C_4 or alkoxy C_1-C_4; R_3 is hydrogen, alkyl C_1-C_4, alkoxy C_1-C_4,



R_5 is hydrogen or n-alkyl C_1-C_4; R_6 and R_7 are hydrogen or alkyl or alkyl C_1-C_4; R_8 and R_9 are hydrogen, alkyl C_1-C_4 or halogen; and A is hydrogen, halogen or alkyl C_1-C_4; provided that A and -O-CONHR$_4$ are meta- and para-, respectively, or para- or meta-, respectively; and provided that R_2 is hydrogen when R_3 is either



3,867,430
METHOD OF PRODUCING ALKANOIC ACID ESTERS OF ALPHA-PHENYLETHYL ALCOHOL

Mark Markovich Grozhan, Prospekt, 31, Kv. 49; Vladimir Vasilievich Kamzolkin, Ulitsa Vavilova, 55, Kv. 25; Jury Anatolievich Lapitsky, Prospekt, 83, Kv. 226, and Andrei Nikolaevich Bashkirov, Ulitsa, 21, Korpus 1, Kv. 13, all of Moscow, U.S.S.R.

Filed June 28, 1971, Ser. No. 157,620
Claims priority, application U.S.S.R., July 9, 1970, 1454037
Int. Cl. C07c *69/02, 69/14*
U.S. Cl. 260—488 CD **3 Claims**

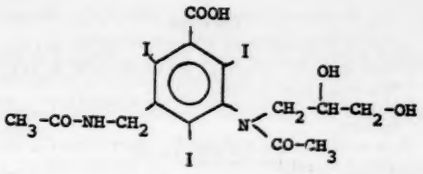
1. A method of producing an alkanoic acid ester of α-phenylethyl alcohol, which comprises effecting a liquid-phase oxidation of ethylbenzene with molecular oxygen at a temperature of 100°-300°C under a pressure of 1–100 atm.g. in the presence of an alkanoic acid anhydride used at a molar ratio to ethylbenzene of 1:1–12 respectively to thereby produce the ester of α-phenylethyl alcohol and of said alkanoic acid.

3,867,431
CONTRAST AGENT FOR ANGIOGRAPHY AND UROGRAPHY

Ernst Felder; Davide Pitre, both of Milan, Italy, and Hans Zutter, Schaffhausen, Switzerland, assignors to Bracco Industria Chimica Societa per Azioni, Milan, Italy

Filed July 25, 1972, Ser. No. 274,973
Claims priority, application Switzerland, Aug. 26, 1971, 12569/71
Int. Cl. C07c *103/32*
U.S. Cl. 260—501.11 **4 Claims**

1. A compound which is the 3-(N-β,γ-dihydroxypropylacetylamino)-5-acetylaminomethyl-2,4,6-triiodobenzoic acid of the formula



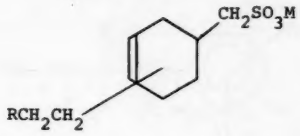
or a water-soluble salt of said acid with a pharmaceutically acceptable alkali metal or amine.

3,867,432
BIODEGRADABLE SULFONATE DETERGENTS

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 3, 1972, Ser. No. 277,837
Int. Cl. C07c *143/00*
U.S. Cl. 260—503 **2 Claims**

1. A biodegradable detergent compound of the formula:



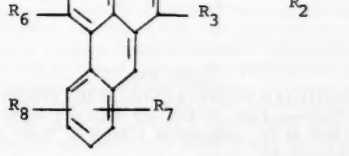
in which M is an alkali metal and R is an alkyl group of from 1 to about 14 carbon atoms.

3,867,433
CYCLOPENTA[J,K]-PHENANTHRENE-4-ACETIC ACIDS AND RELATED COMPOUNDS

Tshung-Ying Shen, Westfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Rahway, N.J.

Filed May 4, 1973, Ser. No. 357,314
Int. Cl. C07c *63/44, 69/76*
U.S. Cl. 260—515 A **5 Claims**

1. The compound of the formula:



wherein:

R_1 and R_2 are each hydrogen or lower alkyl;

R_3 is hydrogen, C_{1-5} alkyl, halo, halo C_{1-5} alkyl, phenyl, C_{1-5} alkylthio, phenylthio, C_{2-5} alkenyl, C_{1-5} alkoxyphenyl, trifluoromethyl or benzyl;

R_4 is hydrogen, trifluoromethyl, halo, C_{1-5} alkyl, phenyl, benzyl;

R_5 is hydrogen, hydroxy, halo, C_{1-5} alkylthio, benzyloxy, C_{1-5} alkylsulfinyl, C_{1-5} dialkylsulfonyl, C_{1-5} dialkylamino-C_{1-5} alkyl, C_{1-5} alkylbenzyloxy, benzylthio, C_{1-5} dialkylamino, halobenzyloxy, C_{1-5} alkoxy, C_{1-5} alkyl, C_{1-5} alkylsulfamyl,

C_{2-5} alkanoyloxy, phenoxy, C_{2-5} alkenyl, C_{2-5} alkenyloxy or benzyl;

R_6 is hydrogen, C_{2-5} alkenyl, halo, C_{1-5} alkoxy, C_{1-5} alkyl, benzyloxy or C_{1-5} alkylthio; at least one of R_4, R_5 or R_6 is hydrogen at any one time;

R_7 is hydrogen, C_{1-5} alkylthio, C_{1-5} alkylsulfinyl or C_{1-5} alkylsulfonyl;

R_8 is hydrogen, halo, hydroxy, C_{1-5} alkoxy, halo C_{1-5} alkyl, phenyl, C_{1-5} alkanoylamino or C_{1-5} alkanoyl; and

M is hydroxy, C_{1-5} alkoxy or pivallyloxy.

3,867,434

PHENYL BUTYRIC ACIDS AND DERIVATIVES THEREOF

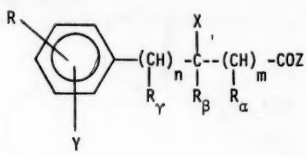
Julius Diamond, Lafayette Hills, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed Nov. 4, 1971, Ser. No. 195,825

Int. Cl. C07c *63/00, 69/64*

U.S. Cl. 260—515 A **11 Claims**

1. A compound of the formula



where:

R is
phenyl or
substituted phenyl where the substituent is Y;

Y is hydrogen,
alkyl having from 1–7 carbon atoms or halo;

$n + m = 2$;

R_γ, R_β and R_α are hydrogen or loweralkyl;

X is halo

Z is hydrogen,
—OH,
loweralkoxy,
benzyloxy or
—OM where M is an alkali, alkaline earth or aluminum metal an ammonium salt.

3,867,435

SUBSTITUTED PHENYLACETIC ACID COMPOUNDS

Julius Diamond, Lafayette Hill, and Norman J. Santora, Roslyn, both of Pa., assignors to William H. Rorer Inc., Ft. Washington, Pa.

Division of Ser. No. 34,870, May 5, 1970,. This application Mar. 10, 1972, Ser. No. 233,717

Int. Cl. C07c *63/32, 69/62*

U.S. Cl. 260—515 A **5 Claims**

1. A substituted phenylacetic acid compound selected from the group consisting of α, *m*-dihalo-*P*-lower alkylphenylacetic acid and its substantially non-toxic ester or salt, said ester being selected from the group consisting of lower alkyl, cyclo-lower alkyl, menthyl, phenyl, phenyl lower alkyl, lower alkyl phenyl, di-lower alkylamino lower alkyl, piperidino lower alkyl, piperazino lower alkyl, and pyrrolidino lower alkyl esters.

3,867,436

METHOD OF PREPARING PHENYLALANINE

Masao Nakamura, Kawasaki; Chieko Uchida, Yokosuka; Masanao Ozaki, Kawasaki, and Takehiko Ichikawa, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,285

Int. Cl. C07c *101/08*

U.S. Cl. 260—518 R **7 Claims**

1. A method preparing phenylalanine which comprises:

a. Maintaining the temperature of a solution of phenylacetaldehyde, ammonium ions, cyanide ions, and free ammonia in an aqueous medium between 50°C and 150°C until one mole of said phenylacetaldehyde simultaneously reacts with one mole-equivalent each of said cyanide and ammonium ions to form an aminonitrile intermediate,

1. said medium containing a water-miscible, organic solvent inert to said phenylacetaldehyde, said ammonia, and said cyanide ions in an amount equal to at least twice the weight of said phenylacetaldehyde,

2. the amount of said free ammonia being at least one mole per mole of said phenylacetaldehyde; and

b. hydrolyzing said intermediate to phenylalanine.

3,867,437

N-ACYL-N′-SUBSTITUTED-2,6-DIAMINO-BENZOIC ACIDS AND PROCESS FOR MAKING THE SAME

Hajime Fujimura, Kyoto; Kenju Suzuki; Osamu Asano, both of Kasugai, and Masaru Asai, Aichi-gun, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co. Ltd., Nogoya City, Japan

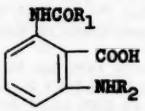
Filed May 20, 1971, Ser. No. 145,468

Claims priority, application Japan, June 9, 1970, 45-49666

Int. Cl. C07c *103/30*

U.S. Cl. 260—518 R **14 Claims**

1. An N-acyl-N′-substituted-2,6-diamino-benzoic acid having the formula



wherein R_1 is a member selected from the group consisting of lower alkyl, lower alkenyl, vinylbenzene, phenoxy-lower-alkyl, phenyl, halophenyl and lower alkoxyphenyl, and R_2 is a member selected from the group consisting of lower alkyl, benzoyl, phenyl and phenyl substituted with halogen, lower alkyl, trifluoromethyl, hydroxy and lower alkoxy.

3,867,438

PROCESS FOR THE OXIDATION OF $\alpha\beta$-UNSATURATED ALDEHYDES TO $\alpha\beta$-UNSATURATED CARBOXYLIC ACIDS

Jorg Hensel; Theodor Lussling, both of Grossauheim; Ewald Noll, Grosskrotzenburg; Hans Schaefer, Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber - Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Division of Ser. No. 188,462, Oct. 12, 1971, Pat. No. 3,773,692. This application July 27, 1973, Ser. No. 383,232

Claims priority, application Germany, Oct. 13, 1970, 2050155

Int. Cl. C07c *57/04, 51/26*

U.S. Cl. 260—530 N **16 Claims**

1. A process for the production of acrylic acid or methacrylic acid by oxidizing acrolein or methacrolein in the presence of water and oxygen in a vapor phase and in the presence of a catalyst, wherein said catalyst consists of (A) a mixture of oxides of the elements Sb, Mo, V and W, and (B) at least

on oxide of the elements Pb, Ag, Cu, Sn, one or Bi, said catalyst having an atomic ratio of Sb : Mo : V : W : Group (B) elements of about 1 – 60 : 12 : 0.5 – 25 : 0.1 – 12 : 0.1 – 12, and further wherein oxidation is conducted at a pressure up to about 3 atmospheres and at a temperature of about 200° – 350°C.

3,867,439

PREPARATION OF POTASSIUM BENZOATE

David J. Hills, Brantford, Ontario, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 17, 1972, Ser. No. 244,898
Int. Cl. C07c *63/02*, *63/08*
U.S. Cl. 260—525 10 Claims

1. In the process wherein liquid toluene is oxidized to benzoic acid by molecular oxygen in the presence of a heavy metal compound catalyst at about 100°–200°C., thereby producing a liquid process effluent consisting essentially of a toluene solution of benzoic acid and said metal compound, the improvement whereby benzoic acid is separated from said effluent as the substantially pure potassium salt by treating the liquid effluent to remove at least a substantial part of said heavy metal compound and to adjust the benzoic acid concentration to about 5–30 percent by weight, adding potassium hydroxide containing up to 60 percent by weight of water to the adjusted effluent at a temperature between the crystallization point of the benzoic acid solution and about 150°C., thereby forming a slurry of solid potassium benzoate in the toluene and separating said potassium benzoate from said slurry.

3,867,440

PROCESS FOR THE PREPARATION; OF GLYCOLIC ACID

Paul Kobetz, and Kenneth L. Lindsay, both of Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

Filed Aug. 28, 1972, Ser. No. 284,226
Int. Cl. C07c *59/06*
U.S. Cl. 260—535 R 9 Claims

1. A process for hydrolyzing glycolonitrile to produce glycolic acid which comprises reacting glycolonitrile with an acid selected from the group consisting of maleic acid, phosphorous acid and sulfurous acid at a temperature of from about 75° to about 175°C to form glycolic acid and an ammonium salt of the acid reacted with the glycolonitrile.

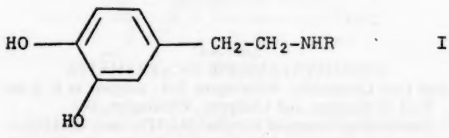
3,867,441

NITRO-SUBSTITUTED PHENYLTHIO DOPAMINES

Ado Kaiser, Neu-Frenkendorf; Wolfgang Koch, Riehen; Marcel Scheer, Basel, and Uwe Wolcke, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 187,118, Oct. 6, 1971, Pat. No. 3,793,342.
This application Sept. 13, 1973, Ser. No. 397,035
Claims priority, application Switzerland, Oct. 30, 1970, 16044/70
Int. Cl. C07c *145/00*
U.S. Cl. 260—551 S 2 Claims

1. Compounds of the general formula



I

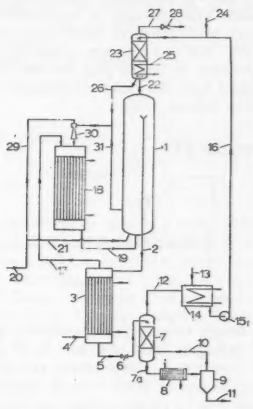
wherein R is a nitro-substituted phenylthio group, or pharmaceutically acceptable salts thereof.

3,867,442

PROCESS FOR PREPARING UREA

Johan D. Logemann, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed Dec. 28, 1971, Ser. No. 213,115
Claims priority, application Netherlands, Dec. 31, 1970, 7019056
Int. Cl. C07c *127/00*
U.S. Cl. 260—555 A 3 Claims



1. In processes for the synthesis of urea by reacting ammonia and carbon dioxide in a synthesis zone, at elevated temperature and pressure and wherein the ammonium carbamate, contained in the effluent synthesis solution which is withdrawn from said synthesis zone, is decomposed at high pressure and the ammonia and carbon dioxide content of said solution is thereafter expelled therefrom firstly in a high pressure zone to generate a high pressure ammonia-carbon dioxide-water vapor mixture and secondly in a low pressure zone to generate a low pressure ammonia-carbon dioxide-water vapor mixture, fresh carbon dioxide is supplied to said high pressure zone and an aqueous urea solution substantially free of ammonium carbamate is discharged from said low pressure zone,

and wherein said high pressure mixture, together with fresh ammonia feed, is condensed in a high pressure condensation zone and then recirculated to said synthesis zone,

and said low pressure mixture is processed into a low pressure ammonium carbamate solution for recirculation, and an inert-containing overhead gas mixture is also discharged from said synthesis zone and processed through a washing zone for recovery of ammonia and carbon dioxide components therefrom into a high pressure ammonium carbamate solution, for recirculation, the improvement consisting essentially in:

a. compressing and delivering said low pressure ammonium carbamate solution to said washing zone for effecting said recovery of ammonia and carbon dioxide components from said overhead gas and to generate a wash solution;

b. withdrawing a quantity of urea-containing solution from said synthesis zone; and

c. utilizing a jet pump, driven by said fresh ammonia feed, to deliver said wash solution and said urea-containing solution to said high pressure condensation zone,

whereby, introduction of additional water in said washing zone is substantially avoided and the heat required to raise the wash solution to the temperature of the said high pressure condensation zone is obtained in said washing zone and thereby excess heat utilizable at a higher temperature is available from said high pressure condensation zone.

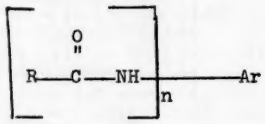
3,867,443
NUCLEAR HYDROGENATION OF N-ARYL POLYAMIDES

Russell E. Malz, Jr., Naugatuck, and Harold Greenfield, Watertown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 228,355
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 R **9 Claims**

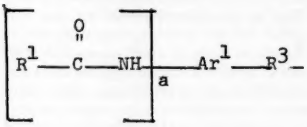
1. A method for nuclear hydrogenation of an N-aryl polyamide to an N-alicyclic polyamide comprising contacting the N-aryl polyamide with hydrogen in the prrsence of an acid-treated rhodium hydrogenation catalst at a temperature of from 5° to 250°C. and at a pressure within the range of from atmospheric pressure to 10,000 psig, the said N-aryl polyamide being selected from the group consisting of those of Formulas I and II as follows:

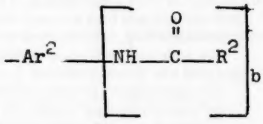
Formula I:



where *n* is an integer from 2 to 4; R is selected from the group consisting of hydrogen, alkyl of from 1 to 17 carbon atoms, cycloalkyl of from 5 to 8 carbon atoms, aryl of from 6 to 10 carbon atoms, aralkyl of from 7 to 14 carbon atoms, and alkaryl of from 7 to 14 carbon atoms; and Ar is an aromatic moiety of phenyl, naphthyl fluoroenyl, diphenyl, phenanthryl, or acenaphthyl origin; and

Formula II:





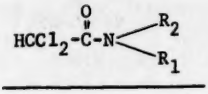
where *a* and *b* are integers having values of from 1 to 4, the sum of *a* and *b* being from 2 to 8; R^1 and R^2 are the same or different and have values as stated for R in Formula I above; R^3 is selected from the group consisting of a single bond, C_1—C_8 alkylene, C_5—C_8 cycloalkylene, C_2—C_8 alkylidene, C_2—C_8 alkenylene, and —O—; and Ar^1 and Ar^2 are the same or different and have values as stated above for Ar.

3,867,444
SCHIFF'S BASE DICHLOROACETAMIDES

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed July 17, 1972, Ser. No. 272,271
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 HL **14 Claims**

1. A compound having the formula



in which R_1 is alkenyl having from 3 to 6 carbon atoms, inclusive, and R_2 is cyclohexenyl-1.

3,867,445
SUBSTITUTED HYDROXYLAMINE ANTI-OXIDANTS

Peter Klemchuk, Yorktown Heights, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 133,700, April 13, 1971, abandoned. This application Oct. 10, 1972, Ser. No. 296,447
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 A **1 Claim**

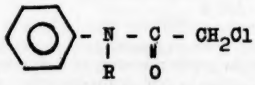
1. The compound β,β'-hydroxyimino-bis-propionamide.

3,867,446
PROCESS FOR THE PREPARATION OF SUBSTITUTED CHLOROACETANILIDES

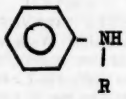
Gyorgy Matolcsy, and Barna Bordas, both of Budapest, Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed May 24, 1973, Ser. No. 363,418
Int. Cl. C07c *103/34*
U.S. Cl. 260—562 B **2 Claims**

1. A process for the preparation of a substituted chloracetanilide having the formula



wherein R represents a C_{1-4} alkyl group, in which a N-alkylanilide of the formula



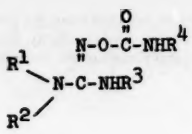
wherein R has the same meanings as defined above, is acylated with chloracetic acid in the presence of phosphorous oxychloride at a temperature above 150° C, under anhydrous conditions.

3,867,447
HYDROXYGUANIDINE O-CARBAMATES

Saul Carl Cherkofsky, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 283,775, Aug. 25, 1972, abandoned. This application June 25, 1973, Ser. No. 373,147
Int. Cl. C07c *129/08*
U.S. Cl. 260—564 G **12 Claims**

1. A compound of the formula

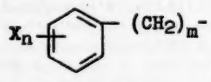


wherein R^1, R^2 and R^3 are selected from the group consisting of

A. hydrogen,

B. an aliphatic hydrocarbon group of 1-8 carbon atoms containing up to two substituents selected from the group consisting of F, Cl, Br and alkoxy of 1–4 carbon atoms and

C. a group of the formula



wherein X is F, Cl, C_1–C_3 alkyl, C_1–C_3 alkoxy, NO_2, CF_3, R^5R^6NCO, $R^5R^6NSO_2$ or R^7SO_2;

$m = 0$–2

$n = 0$–3

R^5 and R^6 are H or C_1–C_4 alkyl;

R^7 is CF_3 or C_1–C_4 alkyl;

R^4 is hydrogen or C_1–C_3 alkyl; and with the proviss that

1. up to one of R^1, R^2 and R^3 is selected from (A) up to two of R^1, R^2 and R^3 is selected from (B), and up to one of R^1, R^2 and R^3 is selected from (C);
2. when R^1 is methyl and R^2 is hydrogen, R^3 is not unsubstituted phenyl or unsubstituted benzyl;
3. when R^1 is methyl and R^3 is hydrogen, R^2 is not unsubstituted phenyl; and
4. when one of R^1, R^2 and R^3 is hydrogen and the other two R groups are selected from (B), the total carbon atoms in the said other two groups is 3–9.

3,867,448

TRIFLUOROMETHYLPHENYL-FORMAMADINES AND ACETAMIDINES

Dieter Duerr, Bottmingen; Hans Aebi, Riehen, and Ludwig Ebner, Stein, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

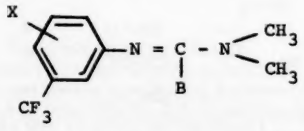
Division of Ser. No. 864,244, Aug. 7, 1969, abandoned, which is a division of Ser. No. 569,828, Aug. 6, 1966, Pat. No. 3,487,156, which is a continuation-in-part of Ser. No. 515,772, Oct. 8, 1965, abandoned, which is a division of Ser. No. 262,863, March 5, 1963, Pat. No. 3,284,289. This application Feb. 22, 1972, Ser. No. 228,326

Claims priority, application Switzerland, Mar. 8, 1962, 2800/62

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **5 Claims**

1. A compound of the formula



in which X is hydrogen, chlorine or CF_3, and B is hydrogen or methyl; or a salt thereof with an acid selected from the group consisting of HCl, HBr, HI, HF, H_2SO_4, H_3PO_4, HPO_3, HNO_3, $HClO_4$, HSO_3NH_2, CH_3COOH, CCl_3COOH, citric acid, lactic acid, formic acid, oxalic acid, glycolic acid, benzoic acid, oleic acid, 2,3,6-trichlorobenzoic acid, dodecylbenzenesulfonic acid, salicylic acid, nicotinic acid and CH_3CCl_2COOH.

3,867,449

INSECTICIDAL PHENYLHYDRAZONE SULFIDES

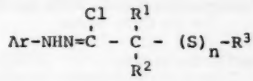
Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 16, 1974, Ser. No. 470,481

Int. Cl. C07c *109/14*

U.S. Cl. 260—566 B **11 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen or alkyl of 1 to 6 carbon atoms, R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, R^3 is alkyl of 1 to 6 carbon atoms or haloalkyl of 1 to 6 carbon atoms containing 1 to 5 fluoro, chloro or bromo groups or phenyl substituted with up to 3 fluoro, chloro or bromo groups, Ar is phenyl substituted with up to 5 fluoro, chloro or bromo groups and n is 1, 2 or 3.

3,867,450

INSECTICIDAL BIS-PHENYLHYDRAZONE SULFIDES

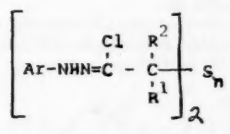
Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 16, 1974, Ser. No. 470,482

Int. Cl. C07c *109/14*

U.S. Cl. 260—566 B **8 Claims**

1. A compound of the formula



wherein R^1 and R^2 individually are hydrogen or alkyl of 1 to 6 carbon atoms, Ar is phenyl substituted with up to 5 fluoro, chloro or bromo groups or with up to 2 nitro groups, and n is 1, 2 or 3.

3,867,451

FLUORO-ALKYLHYDRAZINES

Hector Alfons Vanden Eynde, Mortsel-Antwerpen; Robert Joseph Pollet, Berchem-Antwerpen, and Arthur Henri De Cat, Mortsel-Antwerpen, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed July 12, 1965, Ser. No. 471,437

Claims priority, application Great Britain, July 24, 1964, 29739/64

Int. Cl. C07c *109/02, 109/04;* **G03c** *7/100*

U.S. Cl. 260—569 **6 Claims**

1. A fluoro-alkyl hydrazine corresponding to the following formula:

wherein:

X is a member of the group consisting of a hydrogen atom and a fluorine atom,

R is a member of the group consisting of a hydrogen atom, lower alkyl or phenyl, and

n is a positive integer from 1 to 25 inclusive.

3,867,452

2-NITROPHENYLHYDRAZINES

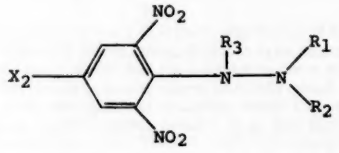
Merrill Wilcox, 2911 N.W. 30th Ter., Gainesville, Fla. 32601

Continuation-in-part of Ser. No. 102,993, Dec. 30, 1970, abandoned. This application Aug. 21, 1972, Ser. No. 282,637

Int. Cl. C07c *109/04*

U.S. Cl. 260—569 **8 Claims**

1. A compound of the formula



wherein X_2 is trifluoromethyl or halogen; each of R_1 and R_2 is lower alkyl; and R_3 is hydrogen or lower alkyl.

3,867,453

PRODUCTION OF KETONE BY REACTION OF ESTER OR THIOL ESTER WITH GRIGNARD REAGENT

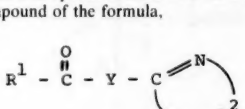
Teruaki Mukaiyama; Masashi Araki, both of Tokyo, and Hisashi Takei, Yokohama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 449,760

Int. Cl. C07c *87/48, 87/36*

U.S. Cl. 260—570 AB **5 Claims**

1. A process for producing a ketone which comprises reacting at a temperature from −78° to +60°C in an inert solvent compound of the formula,



(I)

wherein R^1 is alkyl having 1 – 10 carbon atoms, cycloalkyl having 3 – 8 carbon atoms, alkenyl having 2 – 10 carbon atoms, alkynyl having 2 – 10 carbon atoms, phenyl, phenylalkyl having 7 – 10 carbon atoms or phenylalkenyl having 7 – 10 carbon atoms which may have at least one substitutent selected from the group consisting of alkyl having 1 – 4 carbon atoms, alkoxy having 1 – 4 carbon atoms, oxo, amino, substituted amino and halogen, or a radical in which two or more of the above-mentioned radicals are bonded through —0—; R^2 is a hydrocarbon residue which can form 5- or 6-membered heterocyclic ring together with the C and N atoms which may contain one or more hetero atoms and may be condensed with at least one benzene nucleus and further may contain at least one alkyl substituent; and Y is oxygen or sulfur, with a Grignard reagent of the formula,

$R^3 — Mg — X$ (II)

wherein R^3 is alkyl having 1–10 carbon atoms, cycloalkyl having 3–8 carbon atoms, alkenyl having 2–10 carbon atome, alkynyl having 2–10 carbon atoms, or phenyl which may have at least one substituent selected from the group consisting of alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms and halogen; and X is chlorine, bromine or iodine, in an inert solvent.

3,867,454

1,1-BRIDGED-BIS(N-ARALKYL-2-AMINOETHANOLS)

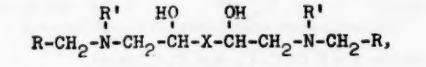
Guy D. Diana, Stephentown, and Royal A. Cutler, Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 123,096, March 10, 1971,. This application Aug. 20, 1973, Ser. No. 389,589

Int. Cl. C07c *91/16, 91/22*

U.S. Cl. 260—570.5 P **12 Claims**

1. 1,1′-(X)-bis[2-[(R-CH_2)(R′)amino]ethanol] of the formula



wherein:

R is phenyl or phenyl substituted by one to three members selected from the group consisting of atertiary alkyl of one to four carbon atoms, hydroxy, atertiary alkoxy of one to four carbon atoms and halo or by a member selected from the group consisting of acetamido, dimethylamino, methylthio, methylsulfonyl, nitro, trifluoromethoxy and trifluoromethyl;

R′ is hydrogen or atertiary alkyl of one to four carbon atoms,

X is a direct linkage, methylene or alkylene of 2 to 12 carbon atoms with bonds to the adjacent carbon atoms at different carbon atoms; or an

acid-addition salt thereof.

3,867,455

PREPARATION OF PHENYLAMINOETHANOLS

Michael Atkinson, and David Hartley, both of London, England, assignors to Allen & Hanburys Limited, London, England

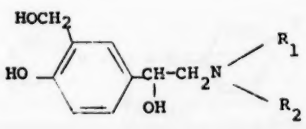
Continuation of Ser. No. 142,747, May 12, 1971,. This application Dec. 14, 1973, Ser. No. 424,711

Claims priority, application Great Britain, June 2, 1970, 26523/70

Int. Cl. C07e *91/16*

U.S. Cl. 260—570.6 **3 Claims**

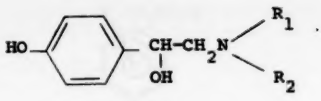
1. A process for the preparation of a phenylaminoethanol derivative of the formula:



wherein:

R_1 is a hydrogen atom or a benzyl group, and

R_2 is a hydrogen atom, a straight or branched chain alkyl radical containing from 1 to 6 carbon atoms, or an arylalkyl radical, which comprises treating a compound of the formula:



wherein:

R_1 and R_2 are as defined above with a aqueous solution of formaldehyde at ambient temperature in the presence of an alkali metal hydroxide and sodium borate.

3,867,456

MONO-OMEGA-HALOALKYL AMINES

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne sur Siene, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 798,192, Feb. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 568,148, July 27, 1966, abandoned, Ser. No. 568,118, July 27, 1966, abandoned, Ser. No. 607,898, Jan. 9, 1967, Pat. No. 3,617,163. This application Jan. 7, 1972, Ser. No. 216,282

Claims priority, application Luxembourg, Jan. 10, 1966, 50,223; June 24, 1966, 51,408; Dec. 9, 1966, 52,555; July 30, 1965, 49,214; Jan. 27, 1966, 50,348; July 4, 1966, 51,474

Int. Cl. C07c *87/58, 87/62*

U.S. Cl. 260—574 **2 Claims**

1. 1-N-β-bromoethylamino-2-nitro-4-methoxy benzene.

2. 1-N-methylamino-2-nitro-4-N'-β-bromoethylaminobenzene.

3,867,457

PREPARATION OF NINHYDRIN

Russell J. Maudsley, Llanerch-Y-Mor, near Holywell, Wales, assignor to Newton Chambers & Company Limited, Sheffield, England

Filed May 18, 1973, Ser. No. 361,738

Claims priority, application Great Britain, June 13, 1972, 27647/72

Int. Cl. C07c *49/82*

U.S. Cl. 260—590 **5 Claims**

1. A method for making Ninhydrin comprising reaction of bis indan 1,3-dione, in the presence of a catalyst, with an oxidising agent at a temperature above 40°C, said catalyst being selected from the group consisting of bromine, iodine, hydrogen iodide and hydrogen bromide and compounds that form any of these during the reaction, and said oxidising agent being selected from the group consisting of organic sulphoxides, free of reducing substituents in which the sulphoxide sulphur atom carries two distinct organic radicals and organic sulphoxides, free of reducing substituents, in which the sulphoxide sulphur atom carries two organic radicals that are linked together.

3,867,458

PROCESS FOR PREPARING 2-ALKOXY-5-METHOXYBENZALDEHYDE

Shinichi Imai, and Kazuya Sano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1972, Ser. No. 234,374

Claims priority, application Japan, Mar. 12, 1971, 46-13362

Int. Cl. C07c *45/00*

U.S. Cl. 260—600 **10 Claims**

1. A process for preparing 2-alkoxy-5-methoxybenzaldehyde, said alkoxy group being a methoxy or an ethoxy group, which comprises reacting, in the presence of potassium carbonate, 2-hydroxy-5-methoxybenzaldehyde with a dialkyl sulfate, said alkyl group being a methyl or an ethyl group.

3,867,459

PRODUCTION OF PENTA-2,4-DIEN-1-ALS AND RELATED TRIENALS

Werner Hoffmann, Ludwigshafen; Walter Himmele, Walldorf, and Werner Aquila, Ludwigshafen, all of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen/Rhein, Germany

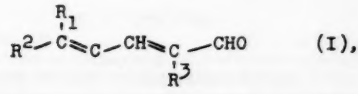
Continuation-in-part of Ser. No. 79,299, Oct. 8, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,733

Claims priority, application Germany, Oct. 15, 1969, 1951883

Int. Cl. C07c *47/20, 47/26*

U.S. Cl. 260—601 R **6 Claims**

1. A process for the manufacture of a penta-2,4-dien-1-al of the formula

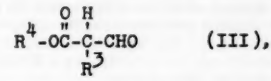


(I),

in which R^1 stands for hydrogen or methyl, R^2 stands for an aliphatic hydrocarbon radical of one to nine carbon atoms, which radical may contain one or two olefinically unsaturated double bonds and which may bear from one to three substituents selected from the group consisting of methyl, ethyl and methoxy and in which R^3 stands for alkyl of one to four carbon atoms, which process comprises: contacting a propargyl alcohol of the formula

(II),

in which R^1 and R^2 have the meanings given above, with an α-formylcarboxylic ester of the formula



(III),

in which R^3 has the meaning given above and R^4 stands for alkyl of one to four carbon atoms, at a temperature of from 100° to 350° C. and from 1 to 5 moles of an α-formyl carboxylic ester are used per mole of said propargyl alcohol.

2. 2,5,9-Trimethyldeca-2,4,9-trien-1-al.

3,867,460

REAGENTS FOR THE STEREOSELECTIVE GENERATION OF THE CHIRAL SIDECHAIN CARBINOL UNIT (C-15) IN PROSTAGLANDIN SYNTHESIS

Elias J. Corey, Pfizer Inc., 235 E. 42nd St., Cambridge, Mass. 02134

Continuation-in-part of Ser. No. 117,748, Feb. 22, 1971, abandoned. This application Jan. 17, 1973, Ser. No. 324,511

Int. Cl. C07f *5/02*

U.S. Cl. 260—606.5 B **8 Claims**

1. Lithium 2-thexyl-8-methyl-2-borabicyclo [3,3,1]-nonylhydride.

3,867,461

NON-HAZARDOUS KETONE PEROXIDE COMPOSITIONS

Newton G. Leveskis, Walnut Creek, and Charles B. Abma, Oakland, both of Calif., assignors to Argus Chemical Corp., Brooklyn, N.Y.

Division of Ser. No. 702,783, Feb. 5, 1968, Pat. No. 3,702,869. This application Dec. 8, 1971, Ser. No. 206,173

Int. Cl. C07c *73/00*

U.S. Cl. 260—610 A **5 Claims**

1. A storage stable ketone peroxide composition formed from at least one alkyl or cycloalkyl ketone having up to eight carbon atoms, said ketone peroxide composition containing at least about 0.5% by weight of stabilizer selected from the group consisting of vinyl pyrrolidone and polyvinyl pyrrolidone to substantially inhibit decomposition of said ketone peroxide of the type that liberates gaseous by-products or decreases effectiveness in terms of lengthened gel time of monomers initiated therewith and said ketone peroxide is present in the composition in an amount sufficient to provide up to about 12.5 percent active oxygen content to said composition.

3,867,462

COLOR INHIBITORS IN GLYCOL ETHERS

Franklin N. Keeney, Midland, and Edmund H. Sommerfield, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1972, Ser. No. 283,383

Int. Cl. C07c *43/00*

U.S. Cl. 260—611.5 **3 Claims**

1. A glycol ether containing a color-inhibiting amount not exceeding about 100 ppm of an alkali or alkaline earth metal borate wherein the ether has the formula,

$$R(OC_nH_{2n})_xOH$$

wherein R is phenyl or alkyl of up to about 6 carbon atoms, n is an integer 2 to 4 and x is an integer 1 to about 5.

3,867,463

USE OF STANNANE AS A REDUCING AGENT

Gerald H. Reifenberg, Hightstown, and William J. Considine, Somerset, both of N.J., assignors to M & T Chemicals Inc., New York, N.Y.

Division of Ser. No. 59,839, June 24, 1970, Pat. No. 3,708,549, which is a division of Ser. No. 742,164, Jan. 3, 1968, Pat. No. 3,654,367. This application May 29, 1972, Ser. No. 255,198

Int. Cl. C07c *29/14*

U.S. Cl. 260—618 H **1 Claim**

1. A method for reducing acetone or benzaldehyde to form isopropanol or benzyl alcohol, respectively, said method comprising the step of reacting acetone or benzaldehyde with stannane, SnH_4, maintaining the reactants together in a reaction mixture wherein the temperature is maintained at about −195° C., and subsequently separating the resultant alcohol from the reaction mixture.

3,867,464

AROMATIZATION OF CYCLOHEXENE DERIVATIVES

Mahmoud S. Kablaoui, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 94,995, Dec. 3, 1970, Pat. No. 3,758,589. This application Dec. 4, 1972, Ser. No. 311,995

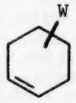
Int. Cl. C07c *33/02*

U.S. Cl. 260—618 R **6 Claims**

1. A method of preparing an aromatic derivative of the formula:

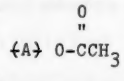
where W is a hydroxyl containing group of from 1 to 10 carbons of the formula:

where R^1 and R^2 are hydrogen or alkyl and A is alkanediyl of from 0 to 9 carbons comprising first contacting a substituted cyclohexene of the formula:



where W is as heretofore defined with a mixture of acetic anhydride and sulfuric acid, said sulfuric acid consisting of between 95 and 100 wt. % H_2SO_4 and between 0 and 5 wt. % water, at a first temperature between about 30 and 145°C. utilizing a first mole ratio of sulfuric acid to substituted cyclohexene of between about 0.1:1 and 3:1, and a second mole ratio of acetic anhydride to cyclohexene of between about 1:1 and 10:1 to form an intermediate acetate product of the formula:

where W′ is a monovalent radical of the formula:



where R^1, R^2 and A are as heretofore defined, and second contacting said acetate intermediate with a hydrolyzing member selected from the group consisting of aqueous acid or base at a second temperature between about 30 and 100°C. utilizing a third mole ratio of hydrolyzing member to acetate of between about 1:1 and **100:1** and recovering said aromatic derivative from the reaction mixture.

3,867,465

SUBSTITUTED P-(1-HYDROXYALKYL) PHENETHYL ALCOHOLS

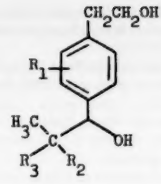
William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed June 4, 1973, Ser. No. 366,763

Int. Cl. C07c *43/20*, *33/02*

U.S. Cl. 260—618 R **4 Claims**

1. A compound of the formula



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36 or straight chain lower alkoxy, and

R_2 and R_3 each independently, represent lower alkyl having 1 to 2 carbon atoms.

3,867,466

ORTHO-METHYLATION OF A PHENOL

Akira Endou; Masao Maeda; Toshiharu Okumichi; Teruo Nakayasu, and Takao Hamada, all of Osaka, Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka-fu, Japan

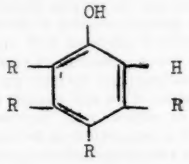
Filed May 28, 1971, Ser. No. 148,183

Claims priority, application Japan, June 2, 1970, 45-48347; July 28, 1970, 45-66224

Int. Cl. C07c *37/16*

U.S. Cl. 260—621 R **8 Claims**

1. A process for the ortho-methylation of a phenol of the general formula:



wherein each R stands for hydrogen, an alkyl group of 1–12 carbon atoms, phenyl group or a lower alkyl-substituted phenyl group, which comprises reacting methanol with a phenol of the above formula in the vapor phase and in the presence of a calcined mixture consisting essentially of manganese oxide and cerium oxide having a weight ratio of manganese oxide to cerium oxide in the range 1:0.01 to 1:0.5. as the catalyst.

3,867,467

PHENOLIC ANTIOXIDANTS

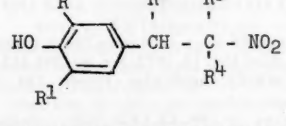
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 9, 1971, Ser. No. 206,553

Int. Cl. C07c *79/16*

U.S. Cl. 260—622 R **3 Claims**

1. A compound having the following structural formula:



wherein R and R^1 are tertiary alkyl radicals having 4 to 8 carbon atoms, R^2 and R^3 are selected from the group consisting of hydrogen and alkyl radicals having 1 to 6 carbon atoms and R^4 is an alkyl radical having 1 to 6 carbon atoms.

3,867,468

PRODUCTION OF DIBROMOSTYRENE AND ALKYL BROMIDE

David Vofsi; Moshe Levy; Stephen Daren, all of Rehovot, and Ella Cohen, Tel-Aviv, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed June 12, 1972, Ser. No. 262,096

Claims priority, application Israel, June 25, 1971, 37149

Int. Cl. C07c *25/28*

U.S. Cl. 260—650 R **5 Claims**

1. A process for the simultaneous production of dibromostyrene and a C_1—C_4 alkyl bromide, which comprises subjecting β-bromoethyl dibromobenzene and a C_1—C_4 alkanol to a pyrolysis reaction at a temperature of from 400° to 550° C. by passage through an empty tube.

3,867,469

OXYCHLORINATION PROCESS

Michael James Ricks, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 20, 1972, Ser. No. 236,197

Claims priority, application Great Britain, Apr. 2, 1971, 8506/71

Int. Cl. C07c *17/02*

U.S. Cl. 260—659 A **6 Claims**

1. In a process for the oxychlorination of olefines by bringing into reaction an olefine, ammonium chloride and molecular oxygen the improvement comprising carrying out the reaction at a temperature of 280° to 360°C in the presence of a supported oxychlorination catalyst comprising a chloride of copper and a chloride of cesium.

3,867,470

HYDROCARBON SEPARATION PROCESS

Petrus F. A. Van Grinsven; Wim Wieldraaijer, and Rudolf J. Maas, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 10, 1973, Ser. No. 423,031

Claims priority, application Great Britain, Dec. 13, 1972, 57471/72

Int. Cl. C07c *7/12*

U.S. Cl. 260—674 SA **9 Claims**

1. A process for the separation of ethylbenzene from a mixture of C_8-aromatics which comprises preferential adsorption of ethylbenzene by contacting the mixture under adsorption conditions with a faujasite in which the number of aluminum atoms per unit cell, A, ranges from 64 to 96, inclusive, and in which faujasite the fraction of equivalents of cesium cations present calculated on total equivalents of cations present in the faujasite is from 0.0119A minus 0.5 to the least of 0.15 or 0.0119A minus 0.7, the remainder of the cations present in the faujasite is selected from the group consisting of strontium, calcium and sodium, followed by desorption of the adsorbed C_8-aromatics.

3,867,471

METHOD FOR PREPARING BUTADIENE AND ISOPRENE

Vagab Safarovich Aliev, ulitsa Nizami, 66, blok. 5, kv. 40; Adilya Khanum Panakh Kyzy Kasimova, prospekt Lenina, 3, kv. 18; Mariam Efimovna Muravchik, Kommunistichesky pereulok, 4, kv. 20; Beniamin Georgievich Ter-Sarkisov, ulitsa 28 aprelya 14, kv. 2, and Shamil Kyazim Ogly Kyazimov, 4 Chernogorodskaya ulitsa, 11, ku.3, all of Baku, U.S.S.R.

Filed Feb. 2, 1973, Ser. No. 329,169

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 R **2 Claims**

1. A method for preparing diolefinic hydrocarbons, selected from the group consisting of butadiene and isoprene, comprising dehydrogenating an olefinic hydrocarbon selected from the group consisting of n-butylenes and isoamylenes under isothermal conditions at a temperature from 560° to 600°C

over a catalyst consisting of 35–50 percent by weight of Cr_2O_3, 20–30 percent by weight of Fe_2O_3, 20–25 percent by weight of ZnO and 0.5–2 percent by weight of SiO_2, with dilution of the starting hydrocarbon with steam in a molar ratio of 1 :10–20, said dehydrogenation being effected in a rising current which is a mixture of the starting hydrocarbon, the catalyst and steam, the concentration of said catalyst in said current being 5–60 kg/cu.m.; continuously separating the spent catalyst from the gaseous dehydrogenation reaction products and recovering said spent catalyst in a down-flowing current in a fluidized bed of the spent catalyst with air at a temperature of 570°–590°C; continuously returning the recovered catalyst to the dehydrogenation process, the amount of the catalyst circulating in the system being 80–200 times the amount of the hydrocarbon feed; withdrawing said reaction products from the system and separating said reaction products.

3,867,472

DEHYDROGENATION PROCESS

James J. Tazuma, Stow, and Mario D. Zadra, Barberton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 2, 1973, Ser. No. 376,092

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 R **8 Claims**

1. A process for the dehydrogenation of monoolefins to diolefins which consists essentially of bringing said monoolefins into contact with a catalyst consisting essentially of at least one salt selected from the group consisting of silver chloride, silver iodide, silver fluoride, silver bromide, cadmium chloride, cadmium iodide, cadmium fluoride, cadmium bromide and copper ferricyanide deposited on an alumina support.

RDK

3,867,473

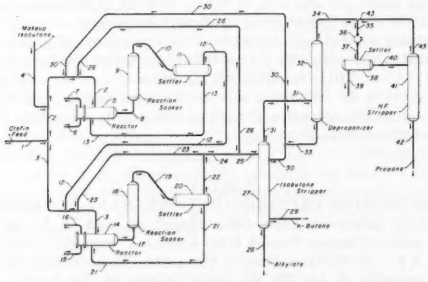
TWO STAGES OF ISOPARAFFIN-OLEFIN ALKYLATION WITH RECYCLE OF ALKYLATE-CONTAINING HYDROCARBON

Robert F. Anderson, La Grange Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 236,049, March 20, 1972, Pat. No. 3,787,518. This application Oct. 18, 1972, Ser. No. 298,709

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.45 **4 Claims**



1. A process for alkylating an isoparaffin selected from the group consisting of isobutane and isopentane with an olefin selected from the group consisting of propylene, butylenes and amylenes which comprises

a. contacting said isoparaffin with a portion of said olefin and a first hydrogen fluoride alkylation catalyst at alkylation conditions in a first reaction zone;

b. separating the reaction zone effluent into a first catalyst phase and a first liquid hydrocarbon phase;

c. supplying said liquid hydrocarbon phase, without fractionation thereof, to a second reaction zone together with the remainder of said olefin and a second hydrogen fluoride alkylation catalyst and therein subjecting the mixture to alkylation conditions;

d. separating the second reaction zone effluent into a second catalyst phase and a second liquid hydrocarbon phase;

e. dividing said second liquid hydrocarbon phase, prior to fractionation thereof, into a first portion, a second portion and a third portion;

f. recycling said first portion to said second zone and supplying said second portion to said first zone;

g. fractionating said third portion of said second liquid hydrocarbon phase to separate said isoparaffin from alkylate;

h. recycling said separated isoparaffin to said first zone; and

i. recovering said alkylate.

3,867,474

Patent Not Issued For This Number

3,867,475

ISOPARAFFIN ALKYLATION

John H. Estes, Wappingers Falls, and Edward L. Cole, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,322

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.63 **5 Claims**

1. In an alkylation process wherein isoparaffin hydrocarbon selected from the group consisting of isobutane, isopentane and mixtures thereof is alkylated with an alkylating agent selected from the group consisting of propylene, butylenes, pentylenes, their sulfates, and mixtures thereof in the liquid phase, in the presence of an acid catalyst selected from the group consisting of sulfuric acid, fluorosulfonic acid, and mixtures thereof at a temperature in the range of about zero to about 100°F and a superatmospheric pressure; the improvement which comprises:

a. treating said acid catalyst with carbon dioxide to form an acid catalyst having a weight ratio of carbon dioxide to acid of at least 0.1/100 at a temperature in the range of about zero to about 100°F and a superatmospheric pressure in the range of from about 50 psig to about 1000 psig; and

b. alkylating said isoparaffin hydrocarbon with said alkylating agent in the presence the carbon dioxide treated acid catalyst of step (a).

3,867,476

ISOMERIZATION OF SATURATED HYDROCARBONS WITH HEXAFLUOROANTIMONIC ACID AND A METAL CATION

Bernard Torck, 86, Route de Maisons 78400, Chatou, France

Filed Oct. 13, 1972, Ser. No. 297,432

Claims priority, application France, Oct. 15, 1971, 71.37264

Int. Cl. C07c *5/28*

U.S. Cl. 260—683.68 **12 Claims**

1. A process for isomerizing a saturated hydrocarbon, said process comprising contacting the saturated hydrocarbon with an essentially liquid catalyst comprising:

a. a hexafluoroantimonic acid selected from compounds $HSbF_6$ and $RSbF_6$ in which R is a saturated cyclic hydrocarbon, and
b. a cation selected from the group consisting of lithium, sodium, potassium, cesium, beryllium, calcium, thallium, indium, copper, silver, zinc, cadmium, mercury or cerium.

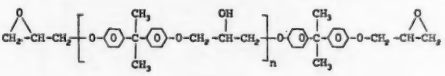
3,867,477

TWO-COMPONENT SYNERGISTIC ANTIOXIDANT SYSTEM FOR POLYOLEFINS

Ismat A. Abu-Isa, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 23, 1974, Ser. No. 435,720
Int. Cl. C08g *45/04*
U.S. Cl. 260—837 R **2 Claims**

1. An oxidation resistant polyolefin composition comprising a polyolefin selected from the group consisting of polyethylene, polypropylene and chlorinated polyethylene, and two to fifteen percent by weight based on said polyolefin composition of an antioxidant, said antioxidant consisting essentially of, by weight, from about 35 percent to about 50 percent of an epoxide having the general formula-



where *n* is from 0 to 18, and the balance litharge.

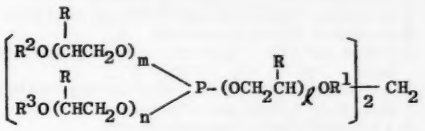
3,867,478

POLYESTER COMPOSITION

Kazuya Chimura; Hiroshi Iwata; Yasuo Nakamura, and Mitsuaki Shiotsuki, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,709
Claims priority, application Japan, Feb. 22, 1972, 47-18353
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 PG **18 Claims**

1. In a polyester composition containing a linear fiberforming polyester and a polyamide having repeating CONH groups as in integral part of the polymeric chain and containing 1 to 10 percent by weight of nitrogen atom of tertiary amino nitrogen in the polyamide molecule, the improvement being that said composition contains additionally a compound (I) of the general formula:



(wherein R is hydrogen or methyl, R^1 is phenylene having or not having hydrocarbon radical substituents, R^2 and R^3 are at least one group selected from aryl and aralkyl groups having or not having a substituent and an alkyl group of C_1 to C_{18} and *l*, *m* and *n* are integers of 1 to 200), the ratio of said linear polyester, polyamide and compound (I) being 70 – 97.5 percent : 2 – 20 percent : 0.5 – 10 percent by weight.

3,867,479

THERMOPLASTIC LINEAR FIBER FORMING POLYESTER RESINS HAVING IMPROVED ANIONIC DYEABILITY

Philip A. Spanninger, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 2, 1973, Ser. No. 376,005
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 **11 Claims**

1. The process which comprises incorporating anion attractive groups in linear thermoplastic fiber forming polyester resin by adding from about 1 to about 15 mol percent of a salt of (A) a hydroxyamine selected from the group consisting of monohydroxyamines and dihydroxyamines and (B) an organic dicarboxylic acid to a polyester forming reaction mixture, said salt being formed in situ in polyester forming reaction mixture, said mol percent being based on the mols of dicarboxylic acid in the polyester exclusive of the acid added with the amine, said reaction mixture comprising (1) a dicarboxylic acid or ester forming derivative of a dicarboxylic acid selected from the group consisting of terephthalic acid, isophthalic acid and naphthalic acid and saturated aliphatic dicarboxylic acids containing from 2 to 12 carbon atoms and (2) a glycol and reacting the mixture under condensation polymerization conditions to form modified linear thermoplastic fiber forming polyester resin that can be dyed to deep shades with acid type dyes, said resin having an intrinsic viscosity of at least 0.3 measured in a 60/40 phenol/tetrachloroethane mixed solvent.

3,867,480

POLYESTER POWDER COATING COMPOSITION

Kanji Fujiyoshi; Yutaka Mizumura, and Junji Sono, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Kita-ku, Osaka-shi, Osaka-fu, Japan

Filed June 25, 1973, Ser. No. 373,219

Claims priority, application Japan, June 30, 1972, 47-65953; June 30, 1972, 47-65954; Jan. 29, 1973, 48-12202

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 8 Claims

1. A polyester powder coating composition comprising
1. a polyester which is prepared by reacting
a. an aromatic dicarboxylic acid or its lower alkyl ester,
b. an aliphatic or alicyclic diol, and
c. at least one of the acids selected from the group consisting of
i. an organic acid having at least three carboxy groups in the molecule or its functional derivative,
ii. a hydroxyaliphatic carboxylic acid, and
iii. an aliphatic dicarboxylic acid;
2. an organic acid anhydride having at least two acid anhydride groups in the molecule; and
3. a polyacrylic acid ester.

3,867,431

LOW MOLECULAR WEIGHT ACRYLIC MODIFIERS FOR RIGID VINYL HALIDE POLYMERS

Jong Jai Whang, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed June 2, 1970, Ser. No. 42,882

Int. Cl. C08f *29/22*, *37/18*

U.S. Cl. 260—899 16 Claims

1. A polymeric composition comprising from 70 to 99 weight percent of a vinyl halide polymer, wherein the vinyl halide polymer contains a major amount of vinyl halide, and from 1 to 30 weight percent of an acrylic addition polymer of
A. at least 75 weight percent of at least one monomer chosen from the group consisting of lower alkyl methacrylates and
B. the balance comprising at least one additional material selected from the group consisting of esters of acrylic and methacrylic acid, the number average molecular weight of said acrylic polymer being in the range of 2000 to 9000.

3,867,482

2-CHLOROETHANEPHOSPHONIC ACID DERIVATIVES

Peter Beutel, Mannheim; Johann Jung, Limburgerhof, and Falk Rittig, Dubliner, all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/-Rhine, Germany

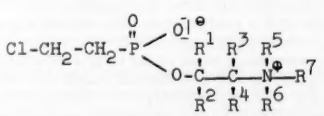
Filed July 24, 1972, Ser. No. 274,579

Claims priority, application Germany, Aug. 14, 1971, 2140842

Int. Cl. C07f *9/40*

U.S. Cl. 260—924 6 Claims

1. A 2-chloroethanephosphonic acid derivative of the formula



where
R^1, R^3, R^5 and R^6 each denote hydrogen or lower alkyl, R^2 and R^4 each denote hydrogen, lower alkyl, phenyl, or cyclohexyl, R^7 denotes hydrogen, phenyl, cyclohexyl, cyclooctyl or alkyl which may be substituted by $-NH_2$, $-OH$, $-CN$, $-Cl$, $-COOR$, $-CONR^2$, $-OR$ or $-SR$, R denoting lower alkyl and R^2 having the meaning given above.

3,867,483

TRIFLUOROMETHYL-NITRO-PHENYL-THIO(DITHIO)PHOSPHATES

Odd Kristiansen, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

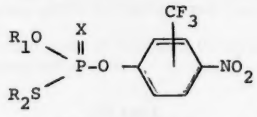
Filed June 4, 1973, Ser. No. 366,822

Claims priority, application Switzerland, June 1, 1972, 8108/72; May 10, 1973, 6719/73

Int. Cl. C07f *9/08*; A01n *9/36*

U.S. Cl. 260—954 7 Claims

1. A compound of the formula



wherein R_1 represents methyl or ethyl; R_2 represents propyl, isopropyl, n-butyl, isobutyl, sec.butyl, tert.butyl, n-pentyl or isopentyl; and X represents oxygen or sulphur.

3,867,484

S,S-BIS-BENZYL ALKYLPHOSPHONATES

Ernst Beriger, Neu-Allschwil, Switzerland, assignor to Ciba-Geigy A.G., Basel, Switzerland

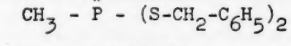
Filed Apr. 1, 1970, Ser. No. 24,855

Claims priority, application Switzerland, Apr. 2, 1969, 5107/69

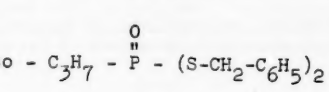
Int. Cl. C07f *9/40*; A01n *9/36*

U.S. Cl. 260—961 2 Claims

1. The compound of the formula



2. The compound of the formula



3,867,485

HUMIDIFIER WITH AUTOMATIC FLUSHING

Richard J. Yeagle, Hartland, Mich., assignor to Skuttle Manufacturing Company, Milford, Mich.

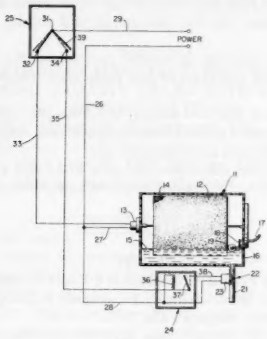
Filed July 26, 1972, Ser. No. 275,274

Int. Cl. B01f *3/04*

U.S. Cl. 261—7 9 Claims

1. A humidifier of the type having a water reservoir wherein the water level is maintained by automatic means and water from the reservoir is conveyed to water distribution means adapted to disperse water into air to be humidified, said water distribution means having an electrical actuating unit, a control circuit for said unit including a humidistat responsive to the air being humidified, normally closed drain means for said reservoir, and means controlled by said humidistat and operative only when said electrical actuating unit is inactive for

opening said reservoir drain means for a predetermined short period to flush said reservoir and then automatically reclosing



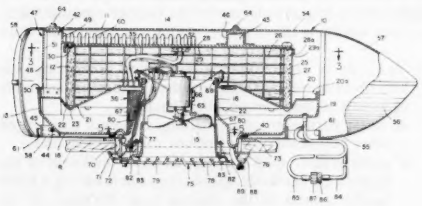
said drain means to permit said water level to be regained in the reservoir.

3,867,486

EVAPORATIVE AIR CONDITIONER

Immanuel P. Nagele, Valley Center, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Sept. 20, 1972, Ser. No. 290,490
Int. Cl. B01f *3/04*
U.S. Cl. 261—29 **3 Claims**



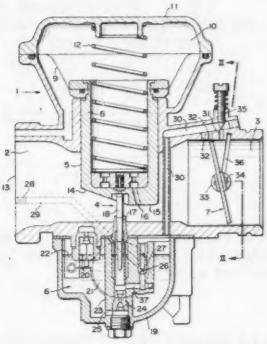
1. An evaporative air conditioner adapted to be mounted on a vehicle comprising a housing having front and rear ends, the housing having openings provided in the front end to permit inward flow of air as the vehicle moves forward, a tank within the housing providing a liquid reservoir and having a bottom wall and an upwardly extending side wall, a liquid-absorbent air filter pad supported above the tank and having an upwardly extending closed continuous shape defining a central enclosure, cover means above the filter pad for closing the top of the central enclosure so that air can enter the central enclosure only through the filter pad, air exhaust means extending through the bottom wall of the tank for permitting air to flow from the central enclosure of the filter pad, means for supplying liquid to the filter pad, the housing being spaced laterally outwardly from the filter pad around the entire periphery of the filter pad to provide a continuous air flow space between the housing and the filter pad around the entire periphery of the filter pad, and an imperforate baffle plate positioned between the front end of the housing and the filter pad and behind the openings in the front end of the housing to prevent direct impingement of air flowing through the openings on the filter pad and to deflect the air into the air flow space between the housing and the filter pad.

3,867,487

CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Hiromitsu Matsumoto, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata Shizuoka, Japan

Filed Nov. 20, 1973, Ser. No. 417,674
Claims priority, application Japan, Nov. 24, 1972, 47-134551
Int. Cl. F02m *19/06*
U.S. Cl. 261—41 D **22 Claims**



1. A carburetor for internal combustion engines of the type comprising an induction pipe horizontally arranged downstream of the Venturi portion, a butterfly-type throttle valve journal supported by said induction pipe, and an idle port on the upper wall of the induction pipe being opened in the induction pipe adjacent the position of the top peripheral edge of the throttle valve to be assumed when the valve is closed or slightly opened, characterized by the provision of passage means formed around the inner wall surface of the induction pipe, said passage means functioning to prevent fuel discharged through the idle port from flowing along the upper inner wall surface of the induction pipe in the downstream direction and conduct said flow of fuel downwardly to and above the junctures between a valve shaft for supporting said throttle valve and the induction pipe wall, and further passage means formed around the journal portions of the valve shaft, said further passage means functioning to conduct said fuel flow, which has reached above the valve shaft, to the lower central surface area of the throttle valve, while turning the flow apart from the inner wall of the induction pipe.

3,867,488

SPARGER WASTE

Hancel W. Porterfield, 1232 Potomac St. N.W., Washington, D.C. 20007

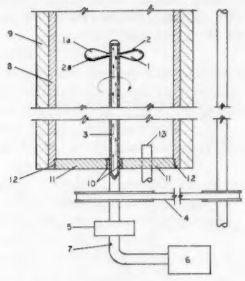
Filed Dec. 19, 1972, Ser. No. 316,536
Int. Cl. B01f *3/04*
U.S. Cl. 261—87 **11 Claims**

1. Apparatus for dissolving a gas in an industrial waste water comprising:

a. a receptacle for receiving a waste water, said receptacle containing a removable screw-out plug;
b. a sparger comprising a rotatable hollow shaft and a hollow propellor mounted atop said rotatable hollow shaft, said propellor having a leading edge and a trailing edge, each of said edges containing pores through which a gas is dispersed;
c. drive means for rotating said sparger;
d. a gas source;
e. connecting means for connecting said gas source to said sparger;

f. a slip joint for connecting said rotatable hollow shaft of said sparger and said connecting means;

g. a water-tight sealing surrounding said rotatable hollow shaft of said sparger, said water tight sealing being mounted securely within said plug; and



h. means for attaching said plug to said receptacle, whereby said industrial waste water may be reused in the industrial process from where it was derived.

3,867,489

METHOD OF PRODUCING AN OXIDATION-RESISTANT UO_2 FUEL BODY

Jack A. Rubin, Encino, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed July 17, 1962, Ser. No. 210,880
Int. Cl. G21c *20/00*
U.S. Cl. 264—0.5 **9 Claims**

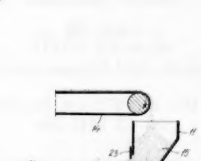
1. A method of forming a UO_2 fuel body resistive to oxidative attack, which comprises mixing UO_2 and a ceramic oxide of relatively low thermal neutron absorption cross section, adding to the resulting mixture a small amount of a compound selected from the class consisting of alkali metal halides and alkaline earth metal halides, and then forming a fuel body of the resulting composition.

3,867,490

METHOD OF AGGLOMERATING PARTICULATE MATERIAL

Karl Goran Gorling, Lidingo, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Apr. 18, 1972, Ser. No. 245,173
Int. Cl. H05b *1/00*
U.S. Cl. 264—24 **4 Claims**



1. A method of agglomerating particulate material by compacting the material between co-acting rolls forming a roll nip wherein surface were on the rolls is substantially reduced, comprising:

a. coating at least a portion of at least one roll on the side of the one roll where the material passes into said nip with a layer of a first particulate magnetic material and retaining said layer on said portion of said roll by magnetic forces;

b. positively guiding a second particulate material into contact with said layer of first particulate magnetic material; and

c. passing said first and second materials through said roll nip and under pressure to compact said materials and form a coherent cake thereof, and

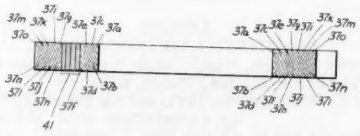
d. disintegrating said coherent cake after said roll nip to form said cake into agglomerates of said particulate materials.

3,867,491

PROCESS FOR REINFORCED CARBON BODIES

Glenn R. Marin, Ransomville, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 48,063, June 22, 1970, Pat. No. 3,712,428.
This application Sept. 7, 1971, Ser. No. 178,433
Int. Cl. C01b *31/07*
U.S. Cl. 264—29 **26 Claims**



1. A process for producing a reinforced carbon body having a shape comprising an outer perimeter and two opposite faces, each face adjoining the outer perimeter, comprising the steps of

1. successively circumferentially winding reinforcing carbon fibers loosely about a mandrel to form an assembly of loosely wound carbon fibers having
   an outer perimeter approximating in length the desired outer perimeter of the finished carbon body, and
   a width greater than the desired axial thickness of the finished carbon body, said carbon fibers having a width having a ratio to the desired axial thickness of the finished carbon body ranging from about 1.25:1 to about 3:1;
2. placing the assembly of loosely wound carbon fibers in a mold cavity of a mold comprising
   a. an outer perimeter conforming essentially to the desired size and shape of the outer perimeter of the desired carbon body; and
   b. a pair of compression plates having mutually opposed faces which conform essentially to the desired sizes and shapes of the faces of the desired carbon body; said plates being coaxially aligned with each other and with the mold outer perimeter, and forming, with said mold outer perimeter, a mold cavity, the distance between said plates being variable by axial movement;
3. axially moving the compression plates together until the plates are separated by approximately the desired axial thickness of the finished carbon body, whereby the circumferentially wound carbon fibers become axially compressed and radially overlapped throughout the circumference of the body in each cross-sectional plane containing the axis of the body; said body having at least one perimeter which is adapted to bear circumferential stress, the circumferentially wound reinforcing fibers adjacent to said stress-bearing perimeter conforming essentially to the shape of said stress-bearing perimeter;

4. introducing a carbonizable binder between the carbon fibers; and
5. carbonizing the carbonizable binder, whereby to form a carbon matrix binding together the reinforcing carbon fibers.

3,867,492

METHOD OF MANUFACTURING OBJECTS CONTAINING A CAVITY FILLED WITH A RIGID FOAM OF POLYURETHANE

Hilmar Frede Drostholm, Gongehusvej 106, 2950 Vedbaek, Denmark

Filed June 23, 1971, Ser. No. 156,031

Claims priority, application Denmark, June 24, 1970, 3276/70

Int. Cl. B29d *27/00*

U.S. Cl. 264—46.6 **8 Claims**

1. A method for manufacturing an object containing a cavity filled with a rigid polyurethane foam coonsisting essentially of placing a shaped piece of flexible open-celled polyurethane foam, impregnated with an organic isocyanate and having its surface protected against moisture by a moisture proof protective barrier, in a cavity of an object or in a location on said object subsequently enclosed to form a cavity, removing at least part of said barrier from said shaped piece directly before or after placement, and exposing said shaped piece to moisture whereby the flexible polyurethane foam of said shaped piece is converted into rigid polyurethane foam.

3,867,493

PROCESS OF PRODUCING SYNTHETIC WOOD HAVING A BEAUTIFUL APPEARANCE

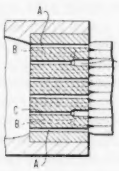
Tatsujiro Seki, Nara, Japan, assignor to Sekisui Kaseihia Kogyo Kabushiki Kaisha, Nara, Japan

Filed Nov. 16, 1972, Ser. No. 307,266

Claims priority, application Japan, Nov. 16, 1971, 46-91727

Int. Cl. B29d *27/00*

U.S. Cl. 264—45.9 **7 Claims**



1. In a process of producing a cellular synthetic wood molding having a desired cross-section by extruding a softened thermoplastic resin containing an expanding agent through the apertures of a die to form a number of expanded strands, coalescing the strands into a formed body while they are in the softened state, and forming a cellular molding therefrom, the improvement which comprises providing the apertures located at the outermost portions of the die among plural apertures formed on the said die with uniform cross-sectional areas over their whole lengths, enlarging a part of each of the apertures arranged in one line or two lines next to the apertures located at the outermost portion of the die, the cross-sectional area of said enlarged portion of the aperture being 1.1 to 3.6 times broader than the cross-sectional area of the apertures located at the outermost portion of the die, said enlarged portions being at the resin discharge side of the apertures and the length of the enlarged portions of the apertures being 10–80% of the length of the apertures, said die containing additional apertures located more inwardly than the apertures located in said first or second line next to the said apertures located at the outermost portion of the die, with all of said additional apertures having cross-sectional areas uniform throughout the whole lengths thereof, whereby the expansion of the strands extruded through said apertures arranged in said one or two lines is suppressed.

3,867,494

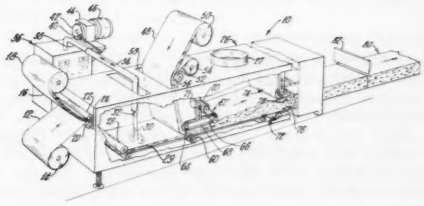
METHOD AND APPARATUS FOR PRODUCING FIBER REINFORCED ORGANIC FOAM

Leonard D. Rood, Columbus, and Ronald E. Kissell, Alexandria, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 6, 1973, Ser. No. 338,486

Int. Cl. B29d *27/03*

U.S. Cl. 264—45.3 **7 Claims**



1. A method for producing a body of fiber-reinforced foam comprising supplying a first layer of fibers, supplying a foamable material substantially uniformly to one surface of said layer, supplying a second layer of fibers and placing said second layer in contact with the one surface of the first layer with the foamable material therebetween, supplying a flexible outer sheet adjacent an outer surface of said first fibrous layer, supplying a second flexible sheet adjacent an outer surface of said second fibrous layer, applying compressive force to the resulting composite layer to enable the foamable material to penetrate into the fibrous layers, and limiting the maximum distance the flexible sheets can move apart to restrict the extent of the foaming of the foamable material.

3,867,495

METHOD FOR FABRICATING MOLDED ELEMENTS BY BONDING SOLID PARTICLES WITH A RESIN

Rudolf Heller, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed June 2, 1972, Ser. No. 258,998

Claims priority, application Switzerland, July 7, 1971, 10029/71

Int. Cl. B29d *27/00*; **B29h** *7/20*

U.S. Cl. 264—51 **8 Claims**

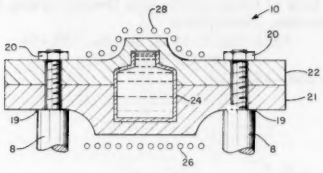
1. A method of fabricating dimensionally stable and load-carrying artificial concrete-construction elements comprising the steps of: admixing with at least 85 percent by weight of a loose mass of mineral grains from 2 to 5 percent by weight of a fine grain granulate of thermoplastic material which can expand into essentially voluminous foamed grains within a given swelling temperature range while internally developing pressure and from about 5 to 10 percent by weight of a non-hardening thermosetting resin which begins to gell within the aforementioned swelling temperature range and completely hardens at higher temperature values, until forming a homogeneous distribution of these components, filling this mixture into the hollow mold cavity of a mold, then sealing the mold in a pressure-tight fashion and initially externally heating the mold up to the swelling temperature range and thereafter to the higher hardening temperature range of the resin.

3,867,496

METHOD AND APPARATUS FOR PRODUCING FINE-GRATED POLYCRYSTALLINE BODIES

Abraham I. Mlavsky, Lincoln; Herbert E. Bates, Sudbury, and Bernard Siegel, Framingham, all of Mass., assignors to Tyco Laboratories, Inc., Waltham, Mass.

Filed June 8, 1972, Ser. No. 260,979
Int. Cl. B29c 5/00; B29j 1/00
U.S. Cl. 264—71 11 Claims



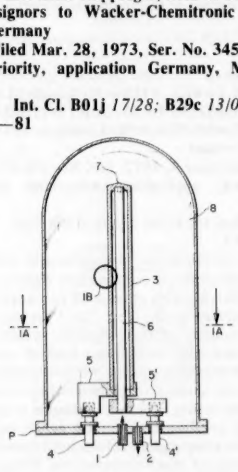
1. Method of producing a dense, homogeneous polycrystalline body of a selected chalcogenide material having a cross-sectional dimension of at least 2 inches, said method comprising disposing a charge of said material in the solid state in a sealed heat-resistant container, mounting said container within a heat susceptor so that said container is enclosed by said susceptor and so that said susceptor and container will move as a unit, electrically heating said susceptor and thereby melting said charge and vibrating said susceptor and container and thereby the resulting melt at a sonic frequency in the range of about 500–10,000 Hz, establishing a thermal gradient across the susceptor so that the upper end of the melt is hotter than the bottom end thereof and the thermal gradient is about 30° C per centimeter of melt height, and directionally cooling said susceptor and container as they are being vibrated so as to cause the melt to solidify directionally with solidification of said melt commencing at the bottom end thereof and progressing upwardly to the top end thereof.

3,867,497

PROCESS OF MAKING HOLLOW BODIES OR TUBES OF SEMI-CONDUCTING MATERIALS

Horst Teich, and Alois Goppinger, both of Burghausen, Germany, assignors to Wacker-Chemitronic GmbH, Burghausen, Germany

Filed Mar. 28, 1973, Ser. No. 345,805
Claims priority, application Germany, Mar. 28, 1972, 2215143
Int. Cl. B01j 17/28; B29c 13/04
U.S. Cl. 264—81 5 Claims



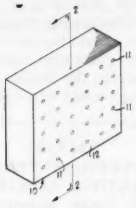
1. A process for making semi-conducting hollow bodies by thermal splitting of volatile semi-conducting silicon compounds, comprising passing the volatile silicon compounds over a carbon mold and depositing thereon in three successive stages, first SiO_2 by burning trichlorosilane and hydrogen in air, then depositing amorphous silicon by passing a reaction gas consisting of 5–12% of $SiHCl_3$ in hydrogen over the deposited SiO_2 at a temperature of 600°–800° C, thereby forming an intermediate layer, next depositing polycrystalline silicon by adjustment of the temperature to 1,050°–1,250° C. and finally, after cooling lifting the polycrystalline silicon body off the mold.

3,867,498

METHOD FOR OPENING THE CELLS OF CELLULAR CLAY BLOCKS

Ned C. Krouskop, Pittsburgh, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1973, Ser. No. 395,527
Int. Cl. B29c 17/04
U.S. Cl. 264—88 3 Claims



1. A method for treating blocks formed from cellular clay having predominantly closed cells, said blocks having at least two opposed surfaces, which comprises punching a plurality of bores through both of said opposed surfaces in such manner that multiple closed cells are fractured during the punching process in the region occupied by each bore, said bores having a diameter from 0.02 to 1.0" and extending at least one third of the distance between the said opposed faces, thereafter applying fluid pressure to the punched block for a period sufficient to break passages from cell-to-cell within the said block without otherwise breaking down the structure of the block.

3,867,499

PROCESS FOR WET-SPINNING FIBERS DERIVED FROM ACRYLIC POLYMERS

Herbert S. Morgan, Apex, N.C., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 115,861, Feb. 16, 1971, abandoned.
This application July 3, 1972, Ser. No. 268,356
Int. Cl. D01f 7/00
U.S. Cl. 264—182 3 Claims

1. A process for producing acrylic fibers having an improved fine structure and outstanding suitability for use a graphite precursors which comprises: preparing a spinnable solution of an acrylic polymer in a solvent therefor, adding to the solution from about 0.1 percent to 5.0 percent based on polymer weight, of a polyalkoxylated fatty acid ester of sorbitol, forming fibers from said solution by extruding the solution through a spinnerette into a coagulating bath maintained at a temperature of from about 20° C to about 50° C, stretching said fibers from about one to six times their length in a boiling water bath and thereafter collecting the fibers on collecting means.

3,867,500

POLYAMIDE-IMIDE FILM INSULATION HAVING IMPROVED ELONGATION AND FOLD ENDURANCE

Edward J. Traynor, Bedford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

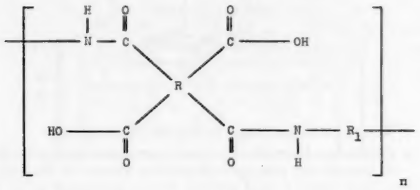
Continuation-in-part of Ser. No. 158,522, June 30, 1971, abandoned. This application June 6, 1973, Ser. No. 367,658

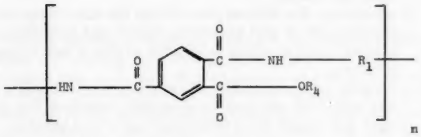
Int. Cl. C08g *20/32*

U.S. Cl. 264—216 13 Claims

1. A method of producing a resinous insulating film in a single pass by:

I. depositing a solvent solution of a soluble polyamide precursor onto a solid substrate, the soluble polyamide precursor being selected from the group consisting of precursors having the structure:





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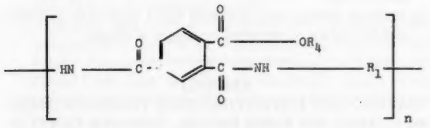
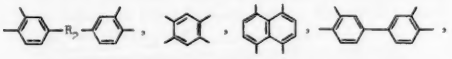
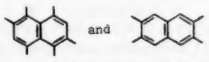
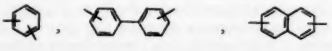


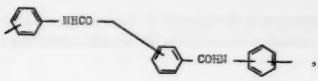
wherein *n* is at least 15, R is at least one tetravalent organic radical selected from the group consisting of:





R_2 being selected from the group consisting of divalent aliphatic hydrocarbon radicals having from one to four carbon atoms and carbonyl, oxy, sulfo and sulfonyl radicals, R_1 is at least one divalent radical selected from the group consisting of:





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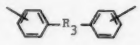


in which R_3 is a divalent organic radical selected from the group consisting of R_2, silico and amido radicals and in which R_4 is selected from the group consisting of: -H, alkyl and aryl radicals, directly followed by,

II. heating the solvent solution at temperatures between about 80° and 110°C, between about 5 minutes to 3 hours, to partically remove solvent and form a film-substrate composite the substrate being effective to restrain film shrinkage in the width and length directions, directly followed by,

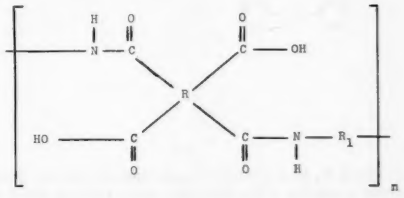
III. heating the film-substrate composite at a temperature of at least 130°C, to semi-cure the film, so that the film contains about 3 to 25 percent volatiles, directly followed by,

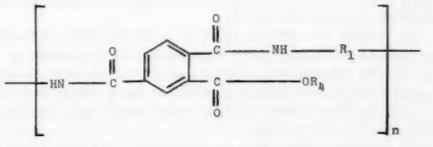
IV. stripping the semi-cured film containing about 3 to 25 percent volatiles from the substrate, directly followed by,

V. stretching the semi-cured film containing about 3 to 25 percent volatiles between about 0.5 and 150 percent at temperatures between about 200° and 350°C, to simultaneously finally cure the film to remove all of the solvent and to provide a solid, cured, stretched insulating film.

9. A method of producing a resinous insulating film in a single pass by;

I. depositing a solvent solution of a soluble polyamide precursor onto a solid substrate, the soluble polyamide precursor being selected from the group consisting of precursors having the structure:





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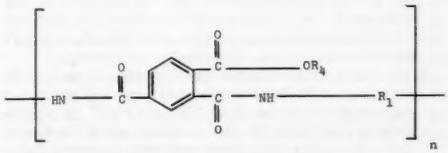
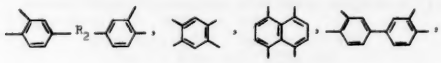
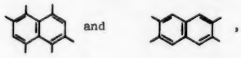
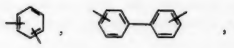


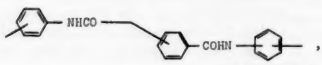
wherein n is at least 15, R is at least one tetravalent organic radical selected from the group consisting of:





R_2 being selected from the group consisting of divalent aliphatic hydrocarbon radicals having from 1 to 4 carbon atoms and carbonyl, oxy, sulfo and sulfonyl radicals, R_1 is at least one divalent radical selected from the group consisting of:





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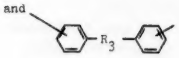


in which R_3 is a divalent organic radical selected from the group consisting of R_2, silico and amido radicals and in which R_4 is selected from the group consisting of: —H, alkyl and aryl radicals, directly followed by,

II. heating the solvent solution at temperatures between about 80° and 110°C, between about 5 minutes to 3 hours, to partially remove solvent and form a film-substrate composite the substrate being effective to restrain film shrinkage in the width and length directions, directly followed by,

III. heating the film-substrate composite at a temperature of between about 130° to 270°C between about 5 minutes and 2 hours to semi-cure the film, so that the film contains about 3 to 25 percent volatiles, directly followed by,

IV. stripping the semi-cured film containing about 3 to 25 percent volatiles from the substrate, and finally,

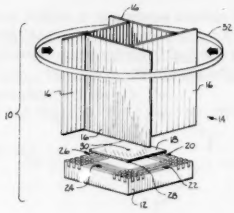
V. stretching the semi-cured film containing about 3 to 25 percent volatiles between about 0.5 and 150 percent at temperatures between about 200° and 350°C, to simultaneously finally cure the film to remove all of the solvent and to provide a solid, cured, stretched insulating film.

3,867,501

METHOD FOR MOLDING CANDLES OF VARYING CONFIGURATION

James W. Powers, 5010 S.E. Britton St., Milwaukie, Oreg. 97222, and Roger L. Manning, 275 N. Shore Ave., Lake Oswego, Oreg. 97034

Filed Dec. 22, 1972, Ser. No. 317,642
Int. Cl. C11c *5/02*; **B28b** *7/02, 7/20*
U.S. Cl. 264—219 **6 Claims**



1. A method of molding candles which comprises:

a. providing a base having a central aperture and a plurality of intersecting longitudinal grooves formed in the upper surface thereof, said grooves being positioned so as to form a plurality of closed geometric figures of different sizes and shapes;

b. providing a flat bottom plate having the same shape as a selected one of said geometric figures and including an aperture corresponding in location to that of said central aperture;

c. forming a mold enclosure of variable cross-sectional size and shape on said base by adjustably attaching flat upright wall panels in a pre-selected set of said grooves;

d. stretching a wick through said apertures and tautly securing same adjacent said base and centrally above said wall panels; and

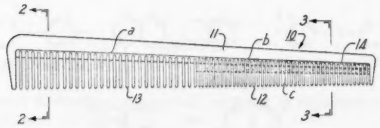
e. pouring molten wax into said mold enclosure to form a candle having a pre-selected size and shape.

3,867,502

MAKING AND EMPLOYING HAIR TEASING COMBS

Carl A. Moody, 889 Rolling Rock Rd., Pittsburgh, Pa. 15234

Division of Ser. No. 722, Jan. 5, 1970, Pat. No. 3,628,545. This application June 29, 1971, Ser. No. 158,016
Int. Cl. B29d *3/00*
U.S. Cl. 264—263 **7 Claims**



1. In a method of the character shown and described for making an improved hair teasing comb, forming a base comb part and an integral group of spaced-apart relatively smooth-surface low friction teeth of a relatively hard material with the teeth extending forwardly in a transverse relation from the base part to define root portions at the base part, applying and securely mounting a relatively soft and resilient rubberlike material of the class consisting of latex rubber, neoprene and silicon resin between the teeth to extend as a continuous non-porous skid-resistant area from the root portions at the base part forwardly along and between inner reaches of the teeth and provide advance root portions for the teeth, and employing the rubberlike material in the form of solidified and non-porous sections between opposed side portions of the teeth to define a hair teasing area longitudinally of the base

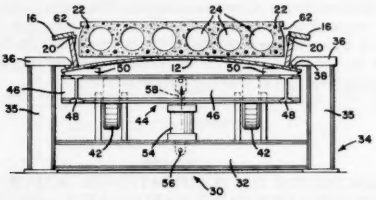
part having the characteristic of high surface adherence without abrasiveness with respect to hair strands.

3,867,503

METHOD OF STRIPPING SLAB CASTING FORMS

Theodore W. Shoe, Fletcher, Ohio, assignor to The Flexicore Co., Inc., Dayton, Ohio

Division of Ser. No. 230,831, March 1, 1972, Pat. No. 3,770,360. This application June 27, 1973, Ser. No. 373,958
Int. Cl. B28b *7/06, 7/10*
U.S. Cl. 264—313 **8 Claims**



1. In a method of stripping from a cured structural slab a metal slab casting form having a bottom pan, opposed upstanding side walls affixed permanently to said bottom pan extending longitudinally of said form, portions extending outwardly of said longitudinally extending side walls and grout keyway forming protrusions projecting from said side walls inwardly of said form, the steps comprising:

a. engaging said outwardly extending portions of said form with first form engaging means,

b. engaging said form with second form engaging means longitudinally thereof at locations thereon spaced transversely outwardly a substantial distance from the center of said form, adjacent said opposite longitudinally extending side edges and inwardly from said first form engaging means, and

c. applying opposing forces through said first and second form engaging means to said form in sufficient magnitude to cause said bottom pan to flex inwardly of said form to a curved configuration without overstressing said bottom pan to cause said side walls to move outwardly with respect to said form a distance sufficient to clear said protrusions from grout keyways formed thereby in a cured slab cast in said form.

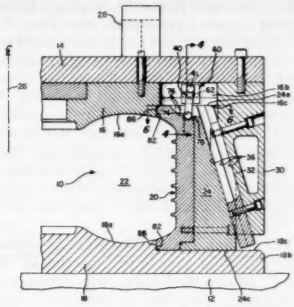
3,867,504

METHOD OF OPERATING A FIRE MOLD

Alan Greenwood, Kent, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 183,931, Sept. 27, 1971, Pat. No. 3,779,677. This application Aug. 9, 1973, Ser. No. 387,052
Int. Cl. B29h *5/08*
U.S. Cl. 264—326 **4 Claims**

1. A method of operating a tire mold having two tire sidewall mold plates, a plurality of tread mold segments, and means for moving said segments radially while in sliding contact with and between said plates during a final phase of mold closing movement and during a first phase of mold opening movement, an improvement in said method comprising, in an additional phase of mold operation while said mold is open after said first phase of mold opening operation and before said final phase of mold closing operation, separating axially of the mold each said segment from each of said sidewall plates to prevent during said additional phase a said sliding contact therebetween, and then moving said segments



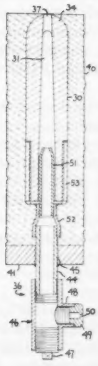
radially inwardly while said segments are spaced apart from both said plates.

3,867,505

METHOD AND APPARATUS FOR CHLORINATING METAL BEARING MATERIALS

Bobby O. Bowers, Paden City, W. Va., and Stanley F. Brzozowski, Coraopolis, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 192,126, Oct. 26, 1971, abandoned. This application June 22, 1973, Ser. No. 372,865
Int. Cl. C01g *23/02*
U.S. Cl. 423—74 **7 Claims**

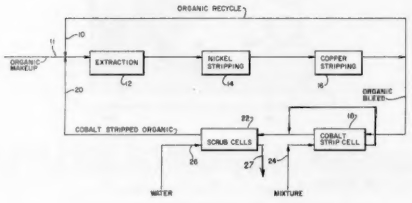


1. A method for chlorinating particulate titanium-bearing material which comprises establishing a fluidized bed of the material in a reaction zone at temperatures at which the material chlorinates, said bed comprising titanium-bearing material having particle sizes largely in the range of 75 microns to 500 microns, said bed being fluidized by a fluidizing stream comprising chlorine, supplying the chlorine to said bed through a plurality of gas conduit means having a single verticle opening at its upper end, at least one principal linear dimension of the opening measured across the opening being not greater than 7/32 inch, so that no significant back flow of solids will occur through said vertical opening upon defluidization of said bed, and which will allow unimpeded startup upon resumption of fluidization, the chlorine thereby being introduced into the bed in a substantially rectilinear direction, and withdrawing titanium tetrachloride from the reaction zone.

3,867,506
COBALT STRIPPING FROM OXIMES

Roald R. Skarbo, Lexington, Mass.; Walter E. Galin, Pawtucket, R.I., and David L. Natwig, Brighton, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed July 19, 1973, Ser. No. 380,793
Int. Cl. B01d *11/00*; C01g *51/00*
U.S. Cl. 423—139 10 Claims



1. Cobalt stripping process for removing chelated cobalt ions from oxime metal extractants in oil carrier comprising

contacting an oxime in oil carrier with an acidic mixture in liquid form consisting essentially of:

a. as a first component, aqueous sulfuric acid solution in a concentration of at least 90 percent by weight,

b. and as a second component a solvent selected from the class consisting of lower alkanols and glacial acetic acid and having the characteristic of dissolving oxime out of the oil at water concentrations less than 5 percent and separating oxime out of the mixture at water concentrations above about 5 percent while retaining the cobalt therein,

the first component to second component volume ratio being no greater than 1:5,

and wherein said mixture has a water concentration below 5 percent, and further comprising,

adding water to said mixture contacted oxime after the contacting step to raise water concentration above 5 percent, and

recovering cobalt and said components from the water.

3,867,507
METHOD FOR REMOVING THE OXIDES OF NITROGEN AS AIR CONTAMINANTS

Albert L. Myerson, Mountainside, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 246,841, April 25, 1972, abandoned. This application Mar. 16, 1973, Ser. No. 341,842
Int. Cl. B01d *53/34*
U.S. Cl. 423—212 7 Claims

1. A thermal method for treating a stream of combustion effluents issuing from either a mobile or stationary source containing NO_x and other contaminants; said method comprising the step of injecting into said stream a hydrocarbon compound and oxygen in sufficient amounts to maintain the ratio of [C] to [NO_x] no greater than 32 to 1 and the ratio of oxygen molecules to carbon atoms no greater than 2.5 to 1, said hydrocarbon compound being one selected from the group consisting of hydrocarbons, oxygen-containing hydrocarbons, nitrogen-containing hydrocarbons, halogen-containing hydrocarbons, and sulfur-containing hydrocarbons at a temperature ranging from 400° to 2,700°C for a sufficient time to substantially reduce the NO_x to molecular nitrogen.

3,867,508
EXHAUST GAS CONVERSION PROCESS AND APPARATUS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

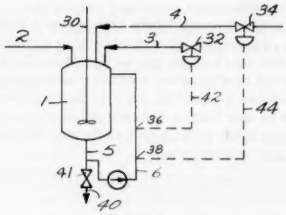
Continuation-in-part of Ser. No. 193,851, Oct. 29, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,808
Int. Cl. B01j *9/04*; B01d *53/00*
U.S. Cl. 423—213.7 6 Claims

1. In a two-stage catalytic exhaust gas conversion system wherein a substantially lead-free exhaust gas containing carbon monoxide and nitrogen oxide is first passed under No_x-reducing conditions through a contacting zone containing a multivalent transitional metal oxide conversion catalyst, and then with added air through a second contacting zone containing a multivalent transitional metal oxide conversion catalyst to effect oxidation of carbon monoxide, the improved method for maintaining continuous conversion of nitrogen oxides which comprises periodically reversing the direction of flow and the sequence in which the exhaust gas contacts the respective catalysts in said conversion zones.

3,867,509
PROCESS FOR THE PURIFICATION OF SULFUR AND NITROGEN CONTAINING WASTE WATER AND WASTE GAS

Friedhelm Geiger; Theodor Lussling, both of Grossauheim, and Wolfgang Igert, Offenbach, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 8, 1973, Ser. No. 358,390
Claims priority, application Germany, May 16, 1972, 2223790
Int. Cl. B01d *53/34*
U.S. Cl. 423—224 14 Claims

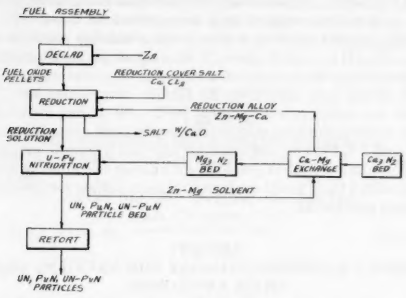


1. A process for the purification of (1) waste water or (2) waste gas containing an oxidizable compound selected from the group consisting of hydrogen sulfide, sulfurous acid, a mercaptan, a mercaptoamino carboxylic acid, a thioether, a disulfide, a sulfoxide, a phenol, allyl alcohol, toluene, anethol, cinnamyl alcohol, cinnamaldehyde, oleic acid, glyceryl trioleate, furfural, indole, β-methylindole and hydrogen cyanide comprising treating the waste water with alkali or alkaline earth chlorite in an acid medium at a pH up to 6 or passing the waste gas through an aqueous solution of alkali or alkaline earth chlorite at a pH of up to 6.

3,867,510
PROCESS FOR RECOVERING URANIUM AND PLUTONIUM FROM IRRADIATED NUCLEAR FUEL OXIDES

William E. Miller, Naperville; John F. Lenc, Westchester, and Irvin O. Winsch, Downers Grove, all of Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 23, 1973, Ser. No. 353,255
Int. Cl. C01g *56/00*
U.S. Cl. 423—251 **14 Claims**

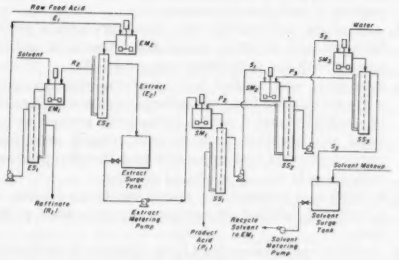


1. A process for recovering uranium and plutonium from irradiated nuclear fuel oxide comprising reducing said fuel oxide to uranium and plutonium metal by contacting said fuel oxide with a liquid-metal reducing solvent, said uranium and plutonium metal being dissolved therein; contacting said liquid-metal solvent with particulate calcium nitride or magnesium nitride to react said dissolved uranium and plutonium with the particulate nitride to form insoluble particles of uranium nitride, plutonium nitride and uranium - plutonium nitride mixtures; separating said insoluble particles from said liquid-metal solvent; and volatilizing any unreacted calcium nitride or magnesium nitride, thereby recovering said uranium and plutonium in the form of particulate uranium nitride, plutonium nitride and uranium - plutonium nitride mixtures.

3,867,511
SOLVENT EXTRACTION OF H_3PO_4

Peter T. Chiang, and John D. Nickerson, both of Atlanta, Ga., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 316,937, Dec. 20, 1972, abandoned, which is a continuation of Ser. No. 129,075, March 29, 1971, abandoned. This application Feb. 16, 1973, Ser. No. 333,084
Int. Cl. C01b *25/16*
U.S. Cl. 423—321 **15 Claims**



1. A process for the removal of iron, aluminum, magnesium and fluorine impurities from wet-process phosphoric acid comprising:

a. digesting phosphate rock with sulfuric acid to form a slurry comprising phosphoric acid, calcium sulfate, and sulfuric acid;

b. separating the slurry into solid and aqueous liquid portions;

c. concentrating the aqueous liquid portion until it contains at least 50 weight percent phosphate, calculated as P_2O_5;

d. passing said concentrated aqueous liquid portion to a solvent extraction system employing from two to four stages of countercurrent extraction, wherein said solvent is an essentially water-immiscible alcohol selected from the group consisting of n-hexanol, n-heptanol, n-octanol, iso-octanol and mixtures thereof, said solvent being employed in a ratio of about one-half to about four parts by weight for each part of said concentrated aqueous liquid portion;

e. obtaining a phosphoric acid rich solvent extract and a raffinate by-product and passing said extract to a water stripping system employing from two to four stages of countercurrent stripping, said extract being employed in a ratio of about 1 to 10 parts by weight of extract for each part of stripping water, whereby about 90 percent of the phosphate in the solvent phase is transferred to the aqueous phase;

f. maintaining the solvent phase as the continuous phase in all the extraction stages and in all but the last of said stripping stages, while maintaining the aqueous phase as the continuous phase in the last water stripping stage;

g. recycling the water stripped solvent from the last stripping stage of step e) to the first extraction stage of step d) and recovering purified phosphoric acid from the first stripping stage.

3,867,512
METHOD OF PREPARING CRYSTALLINE "L" ZEOLITE

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 856,830, Sept. 10, 1969, abandoned. This application Sept. 14, 1972, Ser. No. 289,085
Int. Cl. C01b *33/26, 33/28*
U.S. Cl. 423—329 **4 Claims**

1. In a method for the preparation of crystalline zeolite L wherein reactive silica is dispersed in an alkaline reagent to form an aqueous reaction mixture having a molar composition corresponding to about 0.3 to about 1 $K_2O/(K_2O+Na_2O)$, about 0.3 to 0.6 $(K_2O+Na_2O)/SiO_2$, about 10 to 40 SiO_2/Al_2O_3, and about 15 to 140 $H_2O/(K_2O+Na_2O)$, and wherein said reaction mixture is digested at a temperature and for a period of time sufficient to produce a recoverable yield of zeolite L, the improved method for increasing the rate of formation and/or yield of L zeolite, which comprises utilizing as said reactive silica a reactive silica gel prepare by gelling a silica source selected from the group consisting of alkali metal, alkaline earth metal and ammonium silicates and silicic acid in an aqueous solution having a silica concentrate corresponding to a SiO_2/H_2O mole ratio of at least about 0.005 at a pH below about 8 and a temperature between about 30° and 250°F, correlated with said pH to produce a reactive silica gel containing at least about 4.5 weight percent of chemical water.

3,867,513
METHOD FOR PRODUCING CARBON BLACK

Joseph C. Krejci, Phillips, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 8, 1970, Ser. No. 1,432
Int. Cl. C09c *1/48, 1/50*
U.S. Cl. 423—450 **8 Claims**

1. A method for producing carbon black in a reactor by the pyrolytic decomposition of a hydrocarbon in the presence of an oxidant and a fuel by bringing said hydrocarbon to its carbon black forming temperature in the presence of an oxidant and a fuel, and recovering the carbon black formed, which comprises introducing said hydrocarbon into said reac-

tor in a multiplicity of streams, a plurality of said streams being introduced peripherally to at least one centrally introduced stream, said centrally-introduced stream being introduced at a velocity of about two to about six times the velocity of the peripherally introduced streams.

3,867,514

RECOVERY OF SULFUR VALUES FROM MOLTEN SALT

Keith A. Moore, Staten Island, N.Y., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1973, Ser. No. 360,987
Int. Cl. C01b *17/16*
U.S. Cl. 423—563 **10 Claims**

1. In a process for recovering sulfur values as hydrogen sulfide gas from alkali metal sulfides as reactive material contained in an inorganic molten salt in a reaction zone,

wherein said molten salt is contacted with a gaseous mixture containing carbon dioxide and steam at a selected reaction temperature below 600°C at which the alkali metal sulfide-containing salt is molten to form alkali metal carbonates in said molten salt and hydrogen sulfide gas as a recoverable product,

the improvement which comprises injecting water directly into said reaction zone at a plurality of reaction sites therein,

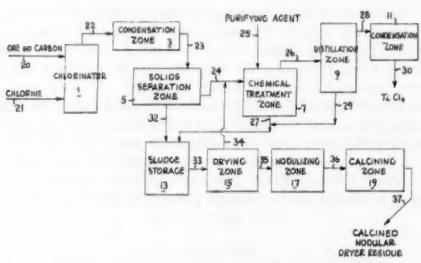
said water being converted to steam to provide at least a portion of the reactant steam for the reaction in said zone while at the same time maintaining the reaction temperature in said zone at said selected temperature.

3,867,515

TREATMENT OF TITANIUM TETRACHLORIDE DRYER RESIDUE

Lester E. Bohl, New Martinsville; Roy H. Rogerson, Moundsville, both of W. Va., and Frederick G. Stroke, McMurray, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1971, Ser. No. 130,330
Int. Cl. C01g *31/00, 23/04;* **C02g** *27/22*
U.S. Cl. 423—593 **15 Claims**



1. Calcined nodular titanium tetrachloride dryer residue comprising metal values including titanium, iron, vanadium and chromium, said metal values being present substantially as metal oxides, said residue having been obtained from purifying titanium tetrachloride produced from titanium-bearing material containing such metal values, and said nodular residue having been calcined at temperatures in excess of 1000°F.

3,867,516

METHOD OF PREPARING A PIGMENT ON AN IRON OXIDE BASE

Fernand Jacques Joseph Bodson, Angleur, Belgium, assignor to Societe des Mines et Fonderies de Zinc de La Vieille Montagne, Societe Anonyme, B-4900 Angleur, Belgium

Filed Apr. 10, 1972, Ser. No. 242,773
Claims priority, application Belgium, May 3, 1971, 43279
Int. Cl. C01g *9/02*
U.S. Cl. 423—632 **11 Claims**

1. A method of preparing an iron oxide pigment base from a sulfate solution derived from the leaching of zinc residues and containing, in particular, ferrous sulfate comprising: heating said sulfate solution to a temperature of about 90°C., adding to said solution a zinc oxide-containing material to raise the pH to a value above 2, blowing air into said solution to precipitate the hydrolyzable impurities together with about 10% of the iron, separating the filtrate, maintaining said filtrate at a temperature of about 90°C. and adding sufficient zinc oxide-containing material to obtain a pH value between 1.7 and 2.5, blowing dispersed air into said filtrate to precipitate iron in the form of goethite and treating said latter precipitate with a basic liquid medium to remove sulfate ions present in said precipitate.

3,867,517

DIRECT RADIOIMMUNOASSAY FOR ANTIGENS AND THEIR ANTIBODIES

Chung-Mei Ling, Crystal Lake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1971, Ser. No. 210,510
Int. Cl. A61k *27/04*
U.S. Cl. 424—1 **4 Claims**

1. A method for determining the presence of a hepatitis associated antigen or its antibody capable of being bound to two hepatitis associated antigens or antibodies respectively in an unknown sample utilizing direct radioimmunoassay comprising:

a. forming a solution of said hepatitis associated antigen or antibody in a buffer mixture;

b. coating a test apparatus by contacting said test apparatus with said solution and

c. incubating said test apparatus while in contact with said solution;

d. washing said incubated coated test apparatus with a buffer mixture;

e. placing said unknown sample in contact with said incubated and washed test apparatus;

f. incubating said unknown sample while in contact with said coated test apparatus for from 0.5 to 42 hours to bond any of said hepatitis associated antigen or antibody present in said unknown sample to said incubated test apparatus;

g. washing said incubated test apparatus with a buffered solution to remove said unknown sample leaving said bonded hepatitis associated antigen or antibody on the coating of said test apparatus;

h. contacting said washed test apparatus with a purified form of said hepatitis associated antigen or antibody labeled with the radioactive isotope I-125;

i. incubating said washed test apparatus while in contact with said purified form of said hepatitis associated antigen or antibody labeled with a radioactive isotope so as to bond said purified form to said antigen or antibody bonded on said test apparatus and thereby produce a radioactively traced incubated coating;

j. washing said radioactively traced incubated coating with a buffered solution to remove any unbonded purified form;

k. counting radiation emitted from said radioactively traced incubated coating; and

l. comparing the number of counts from said coating with the number of counts from a control sample prepared by steps (a) to (k).

3,867,518

RADIOIMMUNOASSAY FOR INSULIN

John William Coffey, West Caldwell, and Hans John Hansen, Allendale, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 9, 1973, Ser. No. 339,803
Int. Cl. A61k *27/04*
U.S. Cl. 424—1 **4 Claims**

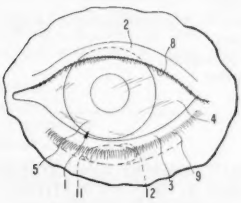
1. In a liquid phase radioimmunoassay for the detection of immunoreactive insulin in blood plasma, the improvement which comprises the step of adding a slurry of zirconyl phosphate gel having a pH of from 6.0 to 6.5 to an incubation mixture of radioactive insulin and test fluid to stop incubation and adsorb antibody-bound insulin, separating the zirconyl phosphate gel-antibodyinsulin complex and measuring the radioactivity thereof.

3,867,519

BIOERODIBLE DRUG DELIVERY DEVICE

Alan S. Michaels, Atherton, Calif., assignor to Alza Corporation

Filed Apr. 27, 1972, Ser. No. 248,168
Int. Cl. A61k *27/12*
U.S. Cl. 424—19 **5 Claims**



1. An ocular delivery device for the sustained administration of a predetermined dosage regimen of ophthalmic drug to the eye of a mammalian patient comprising (1) an inner reservoir comprised of a biodegradable material containing a drug formulation for the eye confined therein and permeable to the passage of drug, and (2) an outer membrane surrounding the inner reservoir, the membrane permeable to the passage of drug, but at a lower rate than through the inner reservoir, the membrane formed from drug release rate controlling bioerodible material comprising a polyvalent ion cross-linked anionic polyelectrolyte with the polyvalent ion a member selected from the group consisting of aluminum, barium, cadmium, calcium, copper, iron and zinc and the anionic polyelectrolyte, a member selected from the group consisting of pharmaceutically acceptable agar, algin, alginic acid, carrageenan, cellulose, gum arabic, gum ghatti, pectic acid, pectin, pectinic acid, and polysaccharide, with the polyelectrolyte cross-linked from two-tenths to three equivalents cross-linking agent selected solely from said polyvalent cation for each equivalent of polyelectrolyte, which material bioerodes in the eye of the patient in from four hours to thirty days into innocuous products in response to the biological environment therein by a process of polyvalent ion displacement with noncross-linking ions present in the eye with said displacement rate corresponding to the extent of polyvalent ion cross-linked, and wherein the membrane material continuously meters the flow of a therapeutically effective amount of said drug from the reservoir to the eye of the patient at a controlled rate over a prolonged period of time.

3,867,520

MEDICATED POLYAMINO ACID FILM FOR OCCLUSIVE DRESSING THERAPY

Shigeo Mori, Chagasaki; Akira Akamatsu, and Kazushi Togo, both of Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 242,754, April 10, 1972, abandoned. This application Feb. 5, 1974, Ser. No. 439,956
Claims priority, application Japan, Apr. 14, 1971, 46-23592
Int. Cl. A61k *1/00*; **A01n** *11/00*
U.S. Cl. 424—36 **8 Claims**

1. A body-contacting solid film for an occlusive dressing essentially consisting of

a. at least one poly-α-amino acid as a solid, film-forming matrix,
   1. said acid being a homopolymer of an α-amino acid of the group consisting of glycine, alanine, phenylalanine, leucine, isoleucine, valine, norvaline, norleucine, methionine, the ω-lower-alkyl esters of glutamic acid and aspartic acid having 1 to 4 carbon atoms in the lower alkyl group thereof, the ω-N-mono-alkanoyl derivatives of lysine and ornithine having 2 to 4 carbon atoms in the alkanoyl group, or a copolymer of at least two members of said group;
b. a carrier dispersed in said matrix as a separate phase,
   1. said carrier being liquid or semi-solid at 37°C,
   2. said carrier being insoluble or poorly soluble in said matrix at 37°C, and non-toxic to the human body when in contact with human skin,
   3. the amount of said dispersed carrier being sufficient to cause a significant portion, greater than incidental traces, of said carrier to migrate to a surface of said film at 37°C; and
c. a pharmaceutically active agent dispersed in said carrier in an amount sufficient to cause migration of said agent with said carrier to said surface at 37°C in a therapeutically significant amount,
   1. the weight of said carrier in said separate phase being at least equal to the weight of said agent dispersed in said carrier, but smaller than the weight of said matrix,
   2. said carrier and said agent being substantially completely retained in said matrix for one month at temperatures below 0°C.

3,867,521

METHOD FOR ABSORPTION OF DRUGS

John J. Miskel, Bloomfield Hills, and Foo Song Hom, Saint Clair Shores, both of Mich., assignors to R. P. Scherer Corp., Detroit, Mich.

Continuation-in-part of Ser. No. 67,276, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 3,188, Jan. 15, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,300
Int. Cl. A61j *3/07*, *3/10*; **A61k** *9/04*
U.S. Cl. 424—37 **6 Claims**

1. A method for enhancing gastrointestinal absorption of a drug of the type which is preferentially absorbed in the upper part of the gastrointestinal tract, said drug also being capable of having the amount of absorption extended by having the dwell time of said drug in the upper part of the gastrointestinal tract extended by prior induction of hypomotility, said method comprising the steps of sequentially absorbing in the upper part of the gastrointestinal tract an effective oral unit dosage amount of said drug, after first commencing absorbing in the upper part of the gastrointestinal tract about 30–95 percent by weight of a material, said percentage being relative to the total weight of said drug and said material, said material being a polyoxypropylene polyoxyethylene block polymer having the formula:

$$HO(CH_2\text{-}CH_2\text{-}O)_a(CH(CH_3)\text{-}CH_2\text{-}O)_b(CH_2\text{-}CH_2\text{-}O)_c\text{-}H$$

wherein

b represents a molecular weight of at least 900 and *a* and *c* represent a molecular weight of about 5- 80 percent by weight of the total molecular weight of the polymer, reducing normal peristaltic action in said gastrointestinal tract with said polymer and thereby inducing a transient condition of hypomotility, particularly in the said upper part of the said gastrointestinal tract, said transient condition of hypomotility enhancing the desired gastrointestinal absorption of said drug, said polymer being the essential gastrointestinal absorption enhancing agent.

3,867,522

ACNE COMPOSITION

Albert M. Kligman, Philadelphia, Pa., assignor to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,350
Continuation-in-part of Ser. No. 197,111, Nov. 9, 1971, abandoned.
Int. Cl. A61u *27/00*
U.S. Cl. 424—153 **3 Claims**

1. A method for the treatment of acne-affected skin which comprises applying to the skin a composition consisting essentially of sodium chloride crystals in a base for topical application, followed by frictional rubbing of said composition on the affected skin to cause abrasion and debridement of the skin, said crystals being of a particle size and being present in an amount sufficient to abrade the skin.

3,867,523

STABILIZATION OF AMPICILLIN WITH SUCROSE

Surendra M. Bahal, Upper Darby, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed June 8, 1970, Ser. No. 44,548
Int. Cl. A61k *21/00*
U.S. Cl. 424—176 **2 Claims**

1. A stabilized aqueous pharmaceutical suspension comprising:

a. 1.25 to 10 percent by weight per volume of an anhydrous ampicillin;

b. About 70 to 86 percent *w/v* of sucrose; and

c. A buffer adjusting pH to a range between about 5 to 6.5

3,867,524

METHOD OF TREATING PERIODONTAL DISEASE

Norbert Ebner, Radenthein, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 205,347, Dec. 6, 1971, abandoned. This application Mar. 29, 1973, Ser. No. 346,079
Int. Cl. A61k *27/00*
U.S. Cl. 424—180 **7 Claims**

1. A method of treating periodontal disease in humans suffering from said disease which method comprises administering to said humans from about 2 to 30 grams of lactulose daily.

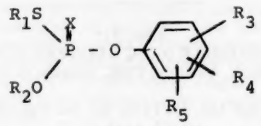
3,867,525

INSECTICIDAL AND ACARICIDAL SUBSTITUTED PHENYL-THIOPHOSPHORIC ACID ESTERS

Jozef Drabek, Allschwil, and Denis Varsanyi, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 292,218, Sept. 25, 1972, Pat. No. 3,839,509. This application July 15, 1974, Ser. No. 488,591
Claims priority, application Switzerland, Sept. 30, 1971, 14208/71; July 27, 1972, 11229/72
Int. Cl. A01n *9/36*
U.S. Cl. 424—211 **10 Claims**

1. An insecticidal or acaricidal composition comprising (1) an insecticidally or acaricidally effective amount of a compound of the formula



wherein

R_1 is C_3–C_5 alkyl,

R_2 is methyl or ethyl,

R_3 is aminocarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl in which the alkyl groups have 1 or 2 carbon atoms,

R_4 and R_5 are each independently hydrogen, chlorine or bromine, and

X is oxygen or sulphur,

and (2) a carrier.

3,867,526

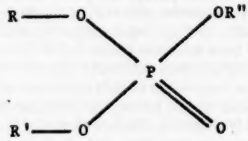
STABILIZED COMPOSITIONS CONTAINING A PHOSPHORIC ACID ESTER PESTICIDE AND AN ALCOHOLIC COMPOUND

Claude Hennart, Aubervilliers; Jean-Pierre Mandon, Paris; Georges Martin, Saint Benoit, and Bernard Rabussier, Avanton, all of France, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. Nos. 833,665, June 16, 1969, Pat. No. 3,705,941, and Ser. No. 17,918, March 9, 1970, abandoned. This application Sept. 20, 1972, Ser. No. 290,509
Claims priority, application France, Mar. 12, 1969, 69.06859; Mar. 12, 1969, 69.06860; Mar. 12, 1969, 69.06861; Mar. 12, 1969, 69.06862; Feb. 12, 1969, 69.03313; June 21, 1968, 68.156025; Luxembourg, Dec. 18, 1969, 60052
Int. Cl. A01n *9/36*
U.S. Cl. 424—219 **12 Claims**

1. A stabilized insecticidal composition comprising

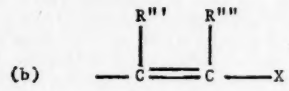
A. about 1 to 95 percent of at least one phosphoric acid ester insecticide defined by the general formula



in which

R and R'' are the same or different alkyl groups containing from 1 to 3 carbon atoms, and R'' is one of the following two groups

in which R''' and R'''' are the same or different and are each hydrogen, chlorine, bromine, or alkyl of from 1 to 3 carbon atoms, and X is chlorine or bromine;



in which R''', R'''' and X have the meanings given above,

B. about 1 to 80 percent of a compound having at 20°C a vapor pressure between 0.01 and 30 TORR and carrying per molecule at least one alcoholic hydroxyl group and acting as solvent on (A) and which compound is selected from

1. aliphatic saturated and unsaturated primary, secondary and tertiary alcohols,
2. saturated and unsaturated alicyclic alcohols,
3. aralkanols and aralkenols, and
4. glycols and their monoesters and monoethers,

C. from about 0.1 to 20 percent of a stabilizing agent for said phosphoric ester, selected from

(α) compounds containing an epoxy group, and selected from:

an alkyloxitane,
an aryloxitane,
an epoxy cyclane and
an epoxidised ester

(β) a diazene, and

(γ) a mixture of a compound as defined under (α) with a diazene, all percentages being based on the total weight of the composition.

3,867,527
2,4-DIAMINO-5-(3-ALKOXY-4,5-METHYLENEDIOXYBENZYL)PYRIMIDINE

Emanuel Grunberg, North Caldwell, and Max Hoffer, Nutley, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 203,869, Dec. 1, 1971, Pat. No. 3,787,409. This application Oct. 10, 1973, Ser. No. 404,953

Int. Cl. A61k *27/00*

U.S. Cl. 424—229 **4 Claims**

1. A therapeutic antibacterial composition comprising from about 1 to about 50 parts of a sulfonamide selected from the group consisting of N^1-(3,4-dimethyl-5-isoxazolyl)-sulfanilamide, 5-methyl-3-sulfanilamidoisoxazole, N^1-(2,6-dimethoxy-4-pyrimidinyl)-sulfanilamide, N^4-ethoxyacetyl)-N^1-(5-methyl-3-isoxazolyl)-sulfanilamide, N^1-(4,5-dimethyl-3-isoxazolyl)-sulfanilamide, N^1-(5,6-dimethoxy-4-pyrimidinyl)-sulfanilamide and salts thereof with pharmaceutically acceptable bases and one part of a pyrimidine of the formula ,25/13

wherein R is lower alkoxy,

or an acid addition salt thereof with a pharmaceutically acceptable acid.

3,867,528
STEROIDAL TOPICAL CREAM BASE

Lawrence Ritter, Suffern, and Robert Arnold Nash, Spring Valley, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 11, 1973, Ser. No. 405,613

Int. Cl. A61k *17/06*

U.S. Cl. 424—241 **7 Claims**

1. A new composition of matter comprising a topical cream base providing enhanced penetration of steroids of the following formulation:

	W/W
Steroid	0.005 to 5.0%
Ethoxylated stearyl alcohol	5 to 25%
Benzyl alcohol	0.9 to 4%
Isopropyl palmitate	1 to 10%
Glycerin	2 to 10%
Sorbitol solution U.S.P.	2 to 10%
Lactic or other acid q.s. to pH 3.0–7.0	
Water qs ad	100%

wherein the steroid is selected from the group consisting of triamcinolone acetonide, triamcinolone acetonide-21-valerate, 16α,17α-cyclopentylidenedioxy-9α-fluoro-11β,21-dihydroxy-1,4-pregnadiene-3,20-dione and 16α,17α-cyclopentylidenedioxy-9α-fluoro-11β,21-dihydroxy-1,4-pregnadiene-3,20-dione-21-acetate.

3,867,529
TRANQUILIZING AND ANTI-ANXIETY PHARMACEUTICAL COMPOSITIONS

Giorgio Ferrari, Milan, and Cesare Casagrande, Como, both of Italy

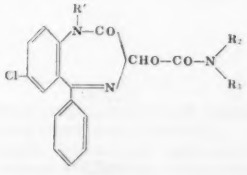
Continuation-in-part of Ser. No. 173,305, Aug. 19, 1971, Pat. No. 3,799,920. This application Apr. 18, 1973, Ser. No. 352,105

Claims priority, application Switzerland, Aug. 24, 1970, 126620/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 **13 Claims**

1. A tranquilizing and anti-anxiety pharmaceutical composition including a carrier, and an effective amount of an active ingredient comprising a 1,4-benzodiazepin derivative containing a carbamic ester group having the general formula:



(I)

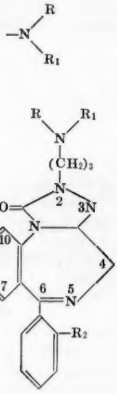
wherein R_1 is selected from the group consisting of hydrogen, and lower alkyls having 1 to 4 carbon atoms, and R_2 and R_3 are, each hydrogen, lower alkyl having from 1 to 4 carbon atoms, cyclohexyl or amino lower alkyl or hydroxy lower alkyl or when R_2 and R_3 are taken together with the attached nitrogen nitrogen atom to form a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino and piperazino.

3,867,530
2-(3-AMINOPROPYL)-2,4-DIHYDRO-6-PHENYL-1H-S-TRIAZOLO[4,3-A][1,4]BENZODIAZEPIN-1-ONES AND METHOD OF TREATMENT THEREWITH

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 14, 1972, Ser. No. 280,158
Int. Cl. A61k *27/00*
U.S. Cl. 424—248 **9 Claims**

1. A process for treating depression and anxiety comprising the administration to a depressed or anxietar human or animal subject of from about 5 to about 300 mg. of a compound of the formula:



Formula I

1

wherein R and R_1 are selected from the group consisting of hydrogen and alkyl of one to three carbon atoms, inclusive; or the group

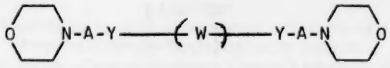
is a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, 4-methylpiperazino, 4-(2-hydroxyethyl)piperazino, and 4-phenylpiperazino; wherein R_2 is selected from the group consisting of fluorine, chlorine, and bromine and wherein R_3 is selected from the group consisting of fluorine, chlorine, bromine, nitro, and trifluoromethyl, or a pharmacologically acceptable acid addition salt tnereof in association with a pharmaceutical carrier.

3,867,531
METHOD OF TREATING CONDITIONS OF DELAYED HYPERSENSITIVITY EMPLOYING MORPHOLINE DERIVATIVES

Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., New York, N.Y.

Filed June 15, 1973, Ser. No. 370,292
Int. Cl. A61k *27/00*
U.S. Cl. 424—248 **6 Claims**

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need of such treatment an effective quantity of a compound of the formula



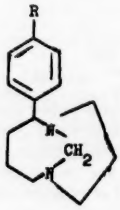
wherein (W) is an aromatic polycyclic nucleus selected from fluoranthene, fluorene, fluoren-9-ol, fluoren-9-one, dibenzofuran, dibenzothiophene, carbazole, N-(lower)alkyl carbazole, xanthene, xanthone, thioxanthene, phenoxathiin, or anthraquinone; Y is selected from carbonyloxy, carbonylthio, oxygen, divalent sulfur, or carbonyl with the provisos that when Y is carbonyloxy or carbonylthio, (W) is other than thioxanthene, phenoxathiin, or anthraquinone, when Y is oxygen or divalent sulfur, (W) is other than thioxanthene or phenoxathiin, and when Y is carbonyl, (W) is other than fluoren-9-ol or anthraquinone; A is selected from a straight or branched alkylene chain of from one to six carbon atoms with the proviso when y is carbonyloxy or carbonylthio, A contains from two to six carbon atoms; and pharmaceutically acceptable acid addition salts thereof.

3,867,532
DIAZABICYCLODECANES AS ANTI-ULCER AGENTS

Louis D. Boyajy, Parsippany, and John H. Gogerty, Dover, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Filed Nov. 19, 1973, Ser. No. 417,368
Int. Cl. A61k *27/00*
U.S. Cl. 424—251 **6 Claims**

1. A method of treating gastrointestinal ulcers in a mammal, which comprises administering thereto an anti-ulcer effective amount of a compound of the formula:



where R is hydrogen, fluoro, chloro or lower alkoxy or a pharmaceutically acceptable acid addition salt thereof.

3,867,533
PREPARATION OF AQUEOUS GEL COMPOSITIONS CONTAINING A WATER-INSOLUBLE ORGANIC INGREDIENT

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 785,772, Dec. 20, 1968, abandoned. This application Sept. 12, 1973, Ser. No. 396,349
Int. Cl. A01n *9/12*; **A61k** *7/00*, *27/00*
U.S. Cl. 424—258 **9 Claims**

1. A method of preparing an aqueous gel composition containing a water-insoluble pharmaceutically or cosmetically active organic ingredient which comprises the following steps: a. heating from 0.1 part to 10 parts by weight of said organic ingredient along with from 50 parts to 15 parts by weight of a polyoxyethylene polyoxypropylene block copolymer to a temperature of about 50°C. to 65°C., said copolymer having the formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein a is an integer such that the hydrophobe represented by (C_3H_6O) has a molecular weight of from 2250 to 4000, and *b* is an integer such that the hydrophile portion represented by (C_2H_4O) constitutes from about 10 to 90 weight percent of the copolymer,

b. adding from 50 parts to 85 parts by weight of water to the mixture resulting from step (a) and cooling the resulting aqueous mixture to 5°C. to 10°C. with stirring until a homogeneous solution is obtained, and

c. allowing the homogeneous solution from step (b) to warm to ambient temperatures whereby a gel composition is obtained, with the provisos that:

1. when *a* in Formula I is an integer such that the average molecular weight of the hydrophobe is about 2250, then the ethylene oxide content is from 50 to 90 weight percent of the copolymer, the total average molecular weight of the copolymer is from 4600 to 10,750 and the gel composition comprises from 40 to 50 weight percent of the copolymer;
2. when *a* in Formula I is an integer such that the average molecular weight of the hydrophobe is about 2750, then the ethylene oxide content is from 45 to 90 weight percent of the copolymer, the total average molecular weight of the copolymer is from 4910 to 13,500 and the gel composition comprises from 40 to 50 weight percent of the copolymer;
3. when *a* in Formula I is an integer such that the average molecular weight of the hydrophobe is about 3250, then the ethylene oxide content is from 35 to 90 weight percent of the copolymer, the total average molecular weight of the copolymer is from 4910 to 15,510 and the gel composition comprises from 30 to 50 weight percent of the copolymer;
4. when *a* in Formula I is an integer such that the average molecular weight of the hydrophobe is about 4000, then the ethylene oxide content is from 35 to 90 weight percent of the copolymer, the total average molecular weight of the copolymer is from 6150 to 2000 and the gel composition comprises from 30 to 50 weight percent of the copolymer, with the further proviso that when *a* in Formula I is an integer such that the average molecular weight of the hydrophobe is about 4000, the ethylene oxide content is from 70 to 90 weight percent, the total average molecular weight of the block polymer is from 16,000 to 20,000 and the gel composition comprises from 15 to 50 weight percent of the copolymer,

all parts by weight being based on 100 parts by weight of said gel composition.

3,867,534

DOSAGE REGIMEN

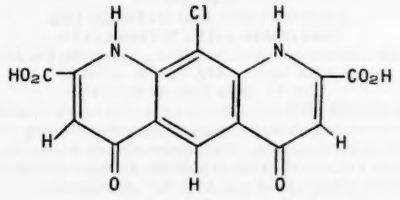
Herbert G. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 278,292, Aug. 7, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,435

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 **8 Claims**

1. An improved dosage regimen comprising the administration to a human of a priming dose of a pharmacologically acceptable salt or ester of a compound of the formula:



followed by the administration of a smaller maintenance dose consisting of one-fifth to one-thousandth the priming dose, said maintenance dose being repeated every 4 to 12 hours.

3,867,535

THIADIAZOLIUM SALTS AS ANTIHELMINTIC AGENTS

Roger Lawrence Newton Harris, Arenda, Australia, and Rudiger Spaun, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

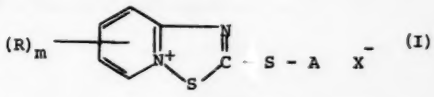
Division of Ser. No. 310,529, Nov. 29, 1972, Pat. No. 3,801,583. This application Jan. 14, 1974, Ser. No. 433,313

Claims priority, application Switzerland, Dec. 1, 1971, 17461/71

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **6 Claims**

1. An anthelmintic composition comprising (a) as active ingredient, an anthelmintically effective amount of a compound of the formula I

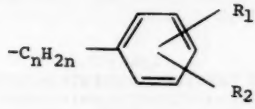


wherein

R represents hydrogen, halogen, nitro, C_1–C_4 alkyl or C_1–C_{10} alkoxy,

m is 1 or 2

A stands for a straight chain or branched alkyl radical having 1–12 carbon atoms, which can be substituted by dialkylamino, alkoxy or alkylthio, with the alkyl groups present in these radicals having in each case 1–4 carbon atoms, or for an aralkyl radical of the formula



wherein *n* denotes 1–3, and R_1 represents hydrogen, halogen, nitro, trifluoromethyl, alkyl, alkoxy, alkylthio each having 1–4 carbon atoms, phenoxy or phenylthio, and R_2 represents hydrogen, halogen, nitro or alkyl, alkoxy or alkylthio each having 1–4 carbon atoms, and X^- represents the anion of a non-toxic inorganic or organic acid, together with (b) a carrier which is tolerated by the organism of warm blood animals and compatible with said compound.

3,867,536

NEW DIAZEPINE DERIVATIVES FOR PRODUCING ANTICONVULSANT EFFECTS

Hans Allgeier, Haagen, Germany, and Andre Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

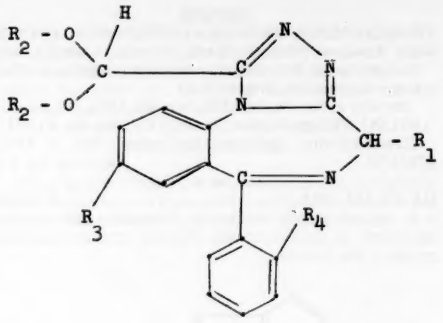
Filed Mar. 30, 1972, Ser. No. 239,780

Claims priority, application Switzerland, Apr. 8, 1971, 5233/71

Int. Cl. A61k *27/00*

U.S. Cl. 424—269 **11 Claims**

1. A therapeutic preparation for producing anticonvulsant effect comprising an anticonvulsive effective amount of a compound of the formula,



wherein R_1 represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms, each of the symbols R_2 represents a methyl or ethyl group, and R_3 and R_4, independently of each other, represents hydrogen, methyl, methoxy, a chlorine, fluorine or bromine atom, a nitro or trifluoromethyl group, at least one of the symbols R_3 and R_4 being other than hydrogen, a pharamaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier.

3,867,537

METHOD OF TREATING NEISSERIA INFECTIONS WITH 6-[2-(3-AMIDINOUREIDO)-2-PHENYL ACETAMIDO]PENICILLANIC ACID

Harvey E. Alburn, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 171,367, Aug. 12, 1971, Pat. No. 3,741,960. This application Sept. 28, 1971, Ser. No. 184,590

Int. Cl. A61k *21/00*

U.S. Cl. 424—271 **1 Claim**

1. A method of treating Neisseria infection caused by a penicillin-resistant strain of *Neisseria Gonorrhoeae* in a human host afflicted with said infection which comprises administering to said human host an effective amount for treating said infection of 6-[D-2-(3-amidinoureido)-2-phenyl acetamido] penicillanic acid.

3,867,538

ENZYME-RESISTANT COMPOSITIONS CONTAINING PENICILLIN IN COMBINATION WITH 6-APA

Richard Donovick, Green Brook, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Continuation of Ser. No. 613,406, Feb. 2, 1967,. This application Oct. 29, 1969, Ser. No. 872,422

Int. Cl. A61k *27/00*

U.S. Cl. 424—271 **10 Claims**

1. A method of protecting penicillin from the action of microorganisms which produce β-lactamase enzymes which destroy penicillin which comprises administering a standard dosage form of the penicillin together with an amount of free 6-aminopenicillanic acid or pharmaceutically acceptable salts, esters and amides thereof, the amount being effective to prevent destruction of the penicillin by β-lactamase enzymes, the amount of penicillin in the dosage form being from about 0.01 to about 1.5 grams per kilogram of body weight.

3,867,539

METHOD OF PRODUCING ANOREXIA AS A TREATMENT FOR OBESITY

Robert I. Henkin, Bethesda, Md., assignor to The United States of America as represented by the Secretary, Department of Health, Education, and Welfare, Washington, D.C.

Filed Apr. 27, 1973, Ser. No. 355,296

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **2 Claims**

1. A method for suppressing the appetite of humans which consists essentially of internally administering to an obese patient an effective anorexigenic amount of histidine or a pharmaceutically acceptable non-toxic salt thereof.

3,867,540

1-(POLYHALOAKYLTHIO) INDAZOLES AS FUNGICIDAL AND BACTERICIDAL AGENTS

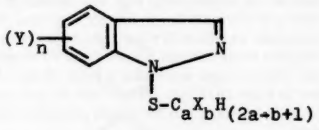
Joseph G. E. Fenyes, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 579,512, Sept. 15, 1966, Pat. No. 3,647,818. This application Dec. 21, 1967, Ser. No. 705,586

Int. Cl. A01n *9/22*

U.S. Cl. 424—273 **10 Claims**

1. A fungicidal composition comprising a fungitoxic amount of an indazole of the formula



wherein *a* is 1 or 2, *b* is 3 when *a* is 1 and is from 3 to 5 when *a* is 2, X is halogen of atomic number from 17 to 35 with at least one X being bonded to the carbon atom which is bonded to the sulfur atom, Y is halogen of atomic number from 17 to 35 in positions 4 to 6 of the indazole nucleus and *n* is an integer from 0 to 1 and an inert carrier therefor.

3,867,541

COMPOSITIONS AND METHODS FOR DISAGGREGATING BLOOD CELLS

Ralph C. Robbins, 1410 N.W. 28th St., Gainesville, Fla. 32601

Filed May 3, 1972, Ser. No. 250,035

Int. Cl. A01n *9/28*; **A61k** *17/18*

U.S. Cl. 424—283 **6 Claims**

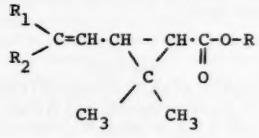
1. A method of disaggregating blood cells consisting essentially of introducing by intra-vascular infusion into the bloodstream a flavonoid having at least two methoxyl substituents, wherein said flavonoid is 3', 4', 5, 6, 7 - pentamethoxyflavone (Sinensetin), 3', 4', 5, 6, 7, 8 -hexamethoxyflavone (Nobiletin), 3, 3', 4', 5, 6, 7, 8 -heptamethoxyflavone (Heptamethoxyflavone), 4', 5, 6, 7 -tetramethoxyflavone (Tetra-O-methylscutellarein), or 4', 5, 7 -trimethoxyflavone (Tri - O - methylapigenin).

3,867,542
CERTAIN SUBSTITUTED CHRYSANTHEMATES AS INSECTICIDES

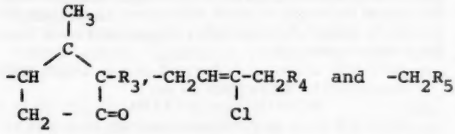
Kenzo Ueda, Nishinomiya; Toshio Mizutani, Hirakata; Nobushige Itaya, Minoo, and Yositosi Okuno, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 118,194, Feb. 23, 1971, Pat. No. 3,766,218. This application June 15, 1973, Ser. No. 370,364
Claims priority, application Japan, Feb. 26, 1970, 45-16805; Mar. 2, 1970, 45-18115; Dec. 17, 1970, 45-114364
Int. Cl. A01n *9/28, 9/12, 9/22*
U.S. Cl. 424—285 **7 Claims**

1. An insecticidal composition comprising an inert carrier and as the active ingredient an insecticidally effective amount of a compound of the formula,



wherein R_1 is methyl, R_2 is a member selected from the group consisting of C_1–C_5 alkoxymethyl, C_3–C_5 alkenoxymethyl, C_3–C_5 alkynoxymethyl, C_1–C_5 alkylcarbonyl, C_2–C_5 alkenylcarbonyl and C_2–C_5 alkynlcarbonyl, or R_1 and R_2 are bonded at respective ends to form a cyclic ketone, R is a member selected from the group consisting of



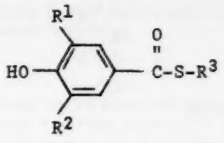
wherein R_3 is C_3–C_5 alkenyl, C_3–C_5 alkynyl or C_5 alkadienyl, R_4 is a substituted or unsubstituted phenyl, thienyl or furyl, the substituent being selected from the group consisting of methyl, methoxy and halogen, and R_5 is a substituted or unsubstituted phenyl, thienyl or furyl, the substituent being selected from the group consisting of C_1–C_3 alkyl, C_3–C_5 alkenyl, C_5 alkadienyl, C_3–C_5 alkynyl, halogen, benzyl, thenyl, furylmethyl, phenoxy, phenylthio, polymethylene containing or not containing oxygen in the carbon chain having 3–4 carbon atoms, phthalimido, thiophthalimido, di- or tetrahydrophthalimido and substituted maleimido, the substituent being one or two C_1–c_4 alkyls or phenyls.

3,867,543
INSECT CONTROL METHODS EMPLOYING CERTAIN SUBSTITUTED BENZOATES

Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 16, 1972, Ser. No. 281,078
Int. Cl. A01n *9/12, 9/24*
U.S. Cl. 424—301 **14 Claims**

10. A method for killing mosquitos which comprises contacting pre-adult mosquitos with a metamorphosis inhibiting amount of a compound of the formula



wherein Y is sulfur or oxygen, U is sulfur or oxygen, R^1 is branched alkyl of 3 to 6 carbon atoms attached to the aromatic ring through a secondary or tertiary carbon atom, R^2 is branched alkyl of 3 to 6 carobn atoms attached to the aromatic ring through a secondary or tertiary carbon atom, and R^3 is 2-alkenyl of 3 to 6 carbons.

3,867,544
4-NITRO-4'-(TRIFLUOROMETHYL) CARBANILIDE EMPLOYED IN ANIMAL HUSBANDRY

Graham T. Stevenson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 1, 1970, Ser. No. 24,814
Int. Cl. A61k *27/00*
U.S. Cl. 424—322 **6 Claims**

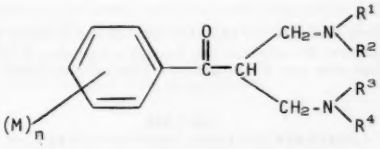
1. In the practice of animal husbandry, the method for the control of coccidial infections which comprises orally administering to animals 4-nitro-4'-(trifluoromethyl)carbanilide said compound being employed in an amount of from about 3 to about 1,000 parts per million of the dietary intake.

3,867,545
CERTAIN 3-AMINO-2-(AMINOMETHYL) PROPIOPHENONES AS FUNGICIDES AND BACTERICIDES

Alan J. Lemin, Plainwell; Malcolm W. Moon, and Arnolds Steinhards, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 651,110, July 5, 1967, abandoned. This application June 8, 1970, Ser. No. 44,641
Int. Cl. A01n *9/20, 9/22*
U.S. Cl. 424—325 **29 Claims**

1. A method of controlling bacteria and fungi, which comprises applying to bacteria, fungi, or a situs an effective amount of a compound selected from the group consisting of free bases of the formula:



wherein M is lower-alkyl of from 1 to 4 carbon atoms, inclusive; lower-alkoxy of from 1 to 4 carbon atoms, inclusive, or halogen; *n* is an integer 0, 1, 2, or 3; and R^1, R^2, R^3, and R^4 are substituent groups more fully described as follows:

Individually, R^1, R^2, R^3, and R^4 are alkyl of from 1 to 8 carbon atoms, inclusive; alkenyl of from 3 to 8 carbon atoms, inclusive; aralkyl of from 7 to 13 carbon atoms, inclusive; cycloalkyl of from 3 to 8 carbon atoms, inclusive; cycloalkenyl of from 4 to 8 carbon atoms, inclusive; and

Collectively, the

group and (and the

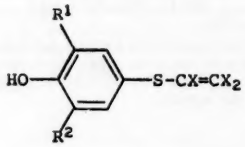
group) is a saturated heterocyclic amino group of from 5 to 7 ring atoms, inclusive; having a total of not more than 15 carbon atoms,
and acid addition salts thereof.

3,867,546
NOVEL RODENTICIDES COMPOSITIONS
Jean-Claude Lechevin, Lyon, France, assignor to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France
Filed June 7, 1972, Ser. No. 260,512
Claims priority, application France, June 10, 1971, 71.21011
Int. Cl. A01n *9/28, 17/4*
U.S. Cl. 424—331 **8 Claims**

1. A rodenticidal composition comprising a solution of 2-(α-p-chlorophenyl-α-phenylacetyl)-1,3-indandione at a concentration from 0.01 to 15 g per kg of solution in polyoxyethylene glycol 300.

3,867,547
INSECTICIDAL PHENOLS
Joseph E. Moore, Richmond, and Gustave K. Kohn, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of Ser. No. 300,082, Oct. 24, 1972, Pat. No. 3,798,274. This application Oct. 3, 1973, Ser. No. 403,300
Int. Cl. A01n *9/12*
U.S. Cl. 424—337 **8 Claims**

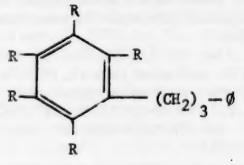
1. A method for killing mosquitos which comprises contacting pre-adult mosquitos with a metamorphosis-inhibiting amount of a compound of the formula



wherein R^1 and R^2 are branched alkyl of 3 to 6 carbon atoms attached to the aromatic ring through a secondary or tertiary carbon atom and X individually is chlorine or bromine.

3,867,548
DIHYDROCINNAMYL PHENOLS USEFUL AS ANTIMICROBIAL AGENTS
Leonard Jurd, Berkeley; Kenneth L. Stevens, Walnut Creek, and Alfred Douglas King, Jr., Martinez, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Division of Ser. No. 257,031, May 25, 1972, Pat. No. 3,775,541. This application Apr. 2, 1973, Ser. No. 347,084
Int. Cl. A01n *9/26*
U.S. Cl. 424—341 **2 Claims**

1. A process for inhibiting the growth of microorganisms selected from the group consisting of bacteria, yeast, and molds in a substance normally subject to spoilage by said microorganisms, which comprises applying to the substance an effective microbial-growth-inhibiting amount of a compound of the structure:



wherein 1 to 3 of the R's are hydroxy, and the remainder of the R's are each independently selected from the group consisting of lower alkoxy and hydrogen wherein at least one of the R's is lower alkoxy.

3,867,549
STABLE STARCH COMPOSITIONS
Christopher H. Costello, Summit, and William Carl Mende, Neshanic, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Continuation of Ser. No. 798,193, Feb. 10, 1969, , which is a continuation-in-part of Ser. No. 520,089, Jan. 12, 1966, abandoned. This application June 28, 1972, Ser. No. 267,194
Int. Cl. A61k *7/00, 7/02*
U.S. Cl. 424—361 **9 Claims**

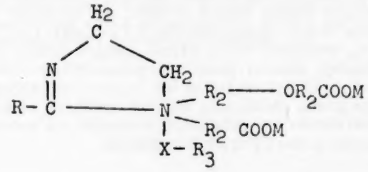
1. A stable, homogeneous aqueous starch lotion for simultaneous cleansing of the skin and depositing a protective starch film on the skin, consisting essentially of from about 5 to about 40 percent by weight of starch from about 10 to about 90 percent by weight of non-irritating detergents selected from the group consisting of

a. fatty acid amides of hydrolyzed protein amino acids represented by the formula:

RCON(H)-peptide-COOM,

wherein R is an alkyl radical containing from 8 to 18 carbon atoms, and M is a cation selected from the class consisting of ammonium, magnesium, alkali metal, monoethanolamine, diethanolamine and triethanolamine.

b. cycloimidates represented by the formula:



wherein R is a hydrocarbon radical of 4 to 18 carbon atoms; R_2 is selected from the group consisting of an aliphatic hydrocarbon of 1 to 4 carbon atoms, a hydroxy substituted hydrocarbon of 1 to 4 carbon atoms, an aliphatic ether of 2 to 4 carbon atoms, a hydroxy substituted aliphatic ether of 2 to 4 carbon atoms, an aliphatic keto of 2 to 4 carbon atoms and a hydroxy substituted aliphatic keto of 2 to 4 carbon atoms; R_3 is selected from the group consisting of hydrogen, an aliphatic hydrocarbon radical of 6 to 18 carbon atoms, an aliphatic-aromatic hydrocarbon radical with the aliphatic hydrocarbon being at least 6 carbon atoms, and a fatty acid glyceride; X is selected from the group consisting of O, SO_3, and OSO_3; and M is an alkali metal,

c. alkylolamides selected from the group consisting of monoethanolamide, diethanolamide and an ethoxylated amide of a fatty acid wherein the acid portion contains at least 6 carbon atoms and mixtures thereof, and

d. mixtures of (a)–(c),

and from about 0.1 to about 5% of a non-toxic stabilizing agent selected from the group consisting of a) silicon dioxide and b) a polymer consisting essentially of about 97.5 to 99.8 percent by weight of acrylic acid and about 2.5 to 0.2 percent by weight of a monomeric polyether of sucrose in which the hydroxyls are etherified with 2 to 6 allyl groups per sucrose molecule, said aqueous lotion having a pH of 4 to 6.

3,867,550

BULK SECONDARY FERMENTATION OF WINE

Walter S. Taylor, Bully Hill Rd. No. 2, Hammondsport, N.Y. 14840

Filed Aug. 17, 1972, Ser. No. 281,330

Int. Cl. C12g *1/06*

U.S. Cl. 426—15 **7 Claims**

1. A process for bulk secondary fermenting of wine slowly and continuously to produce sparkling wine comprising the mixing of added yeast through wine in an elongated bulk tank by the steps of mechanically scooping substantially all settled yeast from the bottom of the tank by rotating means which rotate comparatively slowly whereby the wine is not unduly agitated, slowly raising the yeast along the sides of the tank on a continual basis by said rotating means to within the upper half of said tank and thereafter allowing the yeast to fall from said rotating means by gravity and settle downwardly and filter through the wine while decomposing, said process being carried out under pressure.

3,867,551

PREPARATION OF BEER

Yves Germain Jaegle, 56, Allee de la Robertsau 67, Strasbourg, France

Filed Aug. 9, 1972, Ser. No. 279,208

Claims priority, application France, Aug. 20, 1971, 71.31265

Int. Cl. C12c *11/04*

U.S. Cl. 426—16 **7 Claims**

1. A process for the fermentation of beer which comprises the steps of:

a. tunning groups of mashed batches of wort serially into a single, cylindrical, vertically disposed vat having a conical bottom, said groups of batches initially differing in temperature;

b. introducing the first group of batches into said vat through said bottom at temperatures in the range 10° – 11° Celcius, succeeding groups of batches at intermediate temperatures between said first group and a subsequent final group of batches, and the final group of batches at temperatures in the range 14° – 14.5° Celcius; whereby the temperature of said vat contents is equalized by convection currents resulting from the temperature differential between said batch groups layered with the highest temperature batch initially at the lowest position in said vat;

c. introducing yeast into at least one of said batches and initiating fermentation by said introduced yeast;

d. maintaining the contents of said vat, during fermentation, at a temperature of about 15° Celcius and at a positive pressure of about 500 grams/cm^2;

e. maintaining the temperature equalized vat contents at about 15° Celcius until a beer of the desired degree of fermentation is formed;

f. instituting a warm keep phase for mellowing said beer, extending over a period of about 5 days during which the temperature of the fermentation products in said vat is slowly decreased from 14.5° Celcius to 6° Celcuis by cooling means in said vat;

g. upon completion of the warm keep phase, the resultant mellowed beer is rapidly cooled to a temperature of about – 1° Celcius and maintained substantially thereat to institute a cold keep phase for finishing said beer and lasting for about 5 days;

h. after which the finished beer is clarified, filtered and filled into suitable containers.

3,867,552

PROCESS OF PREPARING POULTRY FOOD PRODUCT

James Douglas Cagle, East Point, and Roger C. Stein, Lovejoy, both of Ga., assignors to Cagle's Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 149,832, June 3, 1971, abandoned. This application July 30, 1973, Ser. No. 383,663

Int. Cl. A22c *21/00*

U.S. Cl. 426—27 **1 Claim**

1. A process of using poultry meat comprising the steps of:

a. removing meat which clings to the bones of poultry;

b. comminuting said removed meat;

c. adding predetermined amounts of seasoning and binder to said meat to form a mixture;

d. adding a predetermined amount of water to said mixture to form a slurry;

e. deaerating said slurry to remove entrapped air bubbles from the slurry;

f. placing said slurry in an artificial sausage-type casing;

g. raising the temperature of the encased slurry to cook the slurry;

h. chilling said cooked product to an internal temperature of approximately 80°F.;

i. removing said cooked product from the casing;

j. slicing the cooked product to a desired size

k. encasing the sliced cooked product in a shell of yeast-rising pie dough; and

l. cooking said dough encased product for a predetermined period at a predetermined temperature.

3,867,553

PROCESS FOR REDUCING THE BOILING TIME OF DEHYDRATED PEAS

Winfried Hitze; Karla Legler, both of Heilbronn; Rolf Stute, and Hans-Ulrich Woelk, both of Flein, all of Germany, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Apr. 11, 1973, Ser. No. 350,266

Int. Cl. D23b *7/02*

U.S. Cl. 426—44 **3 Claims**

1. The process for preparing dehydrated whole peas having a reduced rehydration time comprising the steps of

suspending the peas in an aqueous solution, treating the suspended peas with pectolytic enzymes, which have a high content of polymethylgalacturonases and polygalacturonases and are largely free from cellulytic enzymes, while maintaining the solution temperature in the range from about 15°C to about 50°C,

elevating the solution temperatures to the boiling point to inactivate the enzymes and decompose the pectins contained in the husks of said peas to an extent such that the husks are sufficiently and irreversibly permeable to water and provide faster rehydration and softening of said husks,

cooking the peas in solution, and

drying the peas to a state of dehydration.

3,867,554

YEAST GLYCAN AND PROCESS OF MAKING SAME

Robert William Sucher, 4597 Towne Centre, St. Louis County, Mo. 63128; Ernest Aleck Robbins, Box 429, Rt. 1, High Ridge, Mo. 63123; Daniel Robert Sidoti, 500 Welshire Ct., Ballwin, Mo. 63128; Erich Henry Schuldt, Jr., 9830 McKenzie Rd., St. Louis County, Mo. 63126, and Robert Dudley Seeley, 8959 Larchwood Ct., Crestwood, Mo. 63011

Filed Nov. 29, 1972, Ser. No. 310,452

Int. Cl. A23j *1/18;* **A23l** *1/28*

U.S. Cl. 426—60 **16 Claims**

4. A process for the production of yeast glycan comprising the steps of:

A. Growing a food grade yeast,
B. Harvesting and washing the yeast biomass,
C. Rupturing the yeast cells,
D. Extracting the ruptured yeast cells at a pH of 5.5 to 11 for up to about 60 minutes,
E. Separating the insoluble glycan from soluble cytoplasmic materials, and
F. Recovering a yeast glycan product having a major amount of irregular cell wall fragments and a minor amount of whole cells.

JAJ

3,867,555

MANUFACTURE OF YEAST PROTEIN ISOLATE HAVING A REDUCED NUCLEIC ACID CONTENT BY AN ALKALI PROCESS

Jon Albert Newell, Webster Groves; Ernest Aleck Robbins, High Ridge, and Robert Dudley Seeley, Crestwood, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov. 29, 1972, Ser. No. 310,453
Int. Cl. A23j *1/18;* **A23l** *1/28*
U.S. Cl. 426—60 **20 Claims**

1. A process for producing a yeast protein product comprising the steps of:
a. Rupturing yeast cells,
b. Separating a solubles fraction containing the nucleic acid and protein from an insoluble cell wall debris fraction,
c. Hydrolyzing the nucleic acid with alkali at a pH of about 9.5 to about 12.5 and a temperature of about 50°C. to about 120°C. for less than 4 hours,
d. Precipitating the protein by the addition of acid to a pH of about 2 to about 6 and a temperature of 0°–100°C., and
e. Separating the insoluble protein produced from the nucleic acid containing solubles part.

3,867,556

FATS WITH ENCAPSULATED FLAVORS

Richard T. Darragh, and James L. Stone, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1972, Ser. No. 317,470
Int. Cl. A23l *1/26*
U.S. Cl. 426—98 **34 Claims**

28. A process for double encapsulating volatile flavors comprising the steps of:
a. combining a heat-release, water-insoluble encapsulating agent having a melting point of from about 120°F or higher and a volatile flavoring material under conditions of agitation;
b. spraying the blend resulting from step (a) into a column of chilled air or gas, thus forming single encapsulated particles;
c. separating the encapsulated flavor particles of step (b);
d. placing the encapsulated flavor paraticles of step (c) in a fluidized bed comprising a vertically mounted cylinder with a porous plate bottom;
e. agitating the encapsulated particles of step (d) with forced air causing a continuous tumbling action; and
f. spraying the agitated encapsulated particles of step (e) with a solution of water-soluble, oil-insoluble encapsulating material thereby providing double encapsulated flavor particles.

3,867,557

COMPOSITIONS OF MATTER CONTAINING PARAMETHOXYCINNAMALDEHYDE AS A FLAVORING AGENT AND SWEETENER

James Speer Neely, Liberty Township, Butler Co., and James Anthony Thompson, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 19, 1973, Ser. No. 352,813
Int. Cl. A23l *1/26*
U.S. Cl. 426—175 **12 Claims**

1. A composition in dry form containing as a flavoring agent and sweetener, from about 0.0001% to about 20.0% of paramethoxycinnamaldehyde and from about 80.0% to about 99.9999% of a dry non-toxic ingestible diluent.

3,867,558

PRESERVING RED COLOR IN FRESH RAW UNCURED RED MEATS

Kunito Sato, Chicago, and Harold K. Herring, Wheaton, both of Ill., assignors to Armour and Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 353,315, April 23, 1973, abandoned. This application Mar. 11, 1974, Ser. No. 449,764
Int. Cl. A23b *1/00*
U.S. Cl. 426—265 **8 Claims**

1. In a process for treating fresh raw uncured red meat to preserve the red color of said meat during a storage period of 24 hours or more, the step of introducing into said meat from 0.01 to 0.50 percent by weight of a gamma-pyrone selected from the class consisting of 3-hydroxy-2-methyl-gamma-pyrone, 3-hydroxy-2-ethyl-gamma-pyrone, 5-hydroxy-2-methyl-gamma-pyrone and mixtures thereof, whereby said gamma-pyrone acts to substantially preserve said red color during said period.

3,867,559

METHOD FOR PRODUCING FILLED TUBULAR WAFFLES

Franz Haas, Gerstlgasse 25, A-1210 Wien, Austria

Division of Ser. No. 207,475, Dec. 13, 1971, Pat. No. 3,793,938. This application Mar. 9, 1973, Ser. No. 339,502
Int. Cl. A21d *13/00*
U.S. Cl. 426—283 **4 Claims**

1. In a method for producing tubular waffle shapes by winding a strip of waffle material which is still in a warm, plastic state, wherein the strip of waffle material supplied by a continuously working waffle baking machine is continuously wound helically with suitable overlapping, the resulting wound body is provided internally with a cream-like substance, hardened and divided into pieces of desired length, the improvement consisting in that the wound body is completely filled with the creamy substance and before the hardening of this substance and of the wound body, said wound body containing the creamy substance is sheared into pieces of the desired length whereby the cross section subjected to the shearing returns to the tubular shape.

3,867,560

GELLED PROTEIN PROCESS FOR THE PRODUCTION OF A GELLED PROTEIN FOODSTUFF

Robert Menzi, Geneve, and Hartmut Zeller, Grand-Lancy/Geneve, both of Switzerland, assignors to Vivil A. Muller & Co., Offenburg, Germany

Filed May 2, 1972, Ser. No. 249,494
Claims priority, application Switzerland, May 6, 1971, 6736/71; Mar. 23, 1972, 4313/72
Int. Cl. A23l *1/04*
U.S. Cl. 426—350 **9 Claims**

1. A process for the production of a foodstuff, comprising the steps of:
(1) mixing:

a. at least one assimilable protein material soluble or dispersible in an aqueous medium having a pH between 6.2 and 7.2,
b. at least one assimilable carbohydrate, selected from the group containing monosaccharides and oligosaccharides, and
c. water,

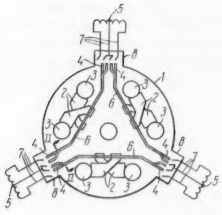
the proportions of these ingredients corresponding, respectively, to from 1 to 45%; from 35 to 60%, and from 4 to 25% of the total weight of the foodstuff, wherein a portion of said assimilable protein material corresponding to at least 1% of the total weight of the foodstuff is in a form capable of foaming in the presence of water;

2. stirring, during or after the mixing operation, the solution or dispersion thus obtained so as to form a foam;
3. mixing at least one gelling agent, selected from the group consisting of gelling proteins and gelling carbohydrates, containing at least 70% by weight of non-assimilable material, with said foam, the amount of said gelling agent being up to 20% of the total weight of the foodstuff; and
4. mixing at least one powdery vegetable cellulose material with the latter mixture, so as to form a homogeneous paste, the proportion of said powdery cellulose material being such that the total amount of gelling agent and cellulose material is from 12 to 40% of the total weight of the foodstuff.

3,867,561
ELECTRODE HOLDER OF THREE PHASE ELECTROSLAG PLANT

Boris Evgenievich Paton, ulitsa Kotsjubinskogo 9, kv. 21; Vladimir Konstantinovich Lebedev, ulitsa Engelsa 25, kv. 12; Igor Vladimirovich Pentegov, Zadorozhny pereulok 6, kv. 14; Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3; Oleg Petrovich Bondarenko, ulitsa Kreschatik 15, kv. 34; Nikolai Fedorovich Medvedenko, ulitsa Vernadskogo 67, kv. 86; Boris Izrailevich Medovar, bulvar Lesi Ukrainki 2, kv. 8, all of Kiev; Pavel Petrovich Loskutov, ulitsa Uritskogo 17, kv. 8, Novosibirsk; Gennady Ivanovich Orlov, ulitsa Vatutina 27, kv. 20, Novosibirsk; Kim Moiseevich Khasin, ulitsa K.Marxa 35, kv. 17, Novosibirsk; Vladimir Ivanovich Lugovsky, ulitsa Petukhova 60, kv. 70, Novosibirsk; Valery Vasilievich Salmin, ulitsa Zorge 95, kv. 69, Novosibirsk; Vilen Fedorovich Marjuschenko, ulitsa Televizionnaya 11, kv. 7, Novosibirsk; Georgy Vasilievich Tamozhnikov, ulitsa Dekabristov 20, Novosibirsk, all of U.S.S.R., and Jury Andreevich Schelkunov, deceased, late of ulitsa Akademika Komarova 19a, kv. 87, Moscow, U.S.S.R. (by Margarita Petrovna Schelkunova, administrator)

Filed Jan. 19, 1973, Ser. No. 325,126
Int. Cl. H05b *7/10*
U.S. Cl. 13—12 2 Claims

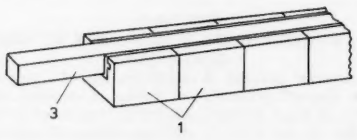


1. An electrode holder for a three-phase electroslag plant comprising: a support plate for carrying a plurality of consumable electrodes affixed thereto the number of which is divisible by six each one of said electrodes being located at the vertices of a regular polygon and insulated from said support plate; a plurality of current-carrying devices each for supplying power to alternately disposed pairs of said consumable electrodes and mounted on said support plate; first bus-bars for connecting phase leads of each secondary winding of a transformer means operatively associated with the electrode holder, with respective ones of said current-carrying devices supplying power to each alternately disposed pair of consumable electrodes in the polygonal array; second bus-bars for interconnecting the midpoints of the secondaries of said transformer means, said second bus-bars being connected in pairs at the points of connection to said midpoints on the transformer secondaries and running paralell with and in immediate proximity to corresponding respective ones of said first bus-bars connecting the secondary windings of said transformer means with said current-carrying devices.

3,867,562
ANCHORING FOR AN ELECTRICALLY CONDUCTIVE BAR IN A GROOVE IN AN ELECTRODE MADE OUT OF A CARBON BLOCK

Werner K. Fischer, Venthone, and Raoul Jemec, Zollikerberg, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 4, 1974, Ser. No. 439,625
Claims priority, application Switzerland, Feb. 9, 1973, 544578/73
Int. Cl. H05b *3/06*
U.S. Cl. 13—25 3 Claims

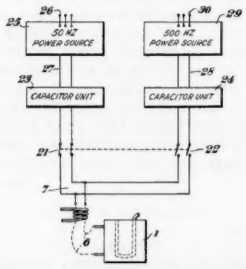


1. An anchoring arrangement for a conductor bar in an electrode block, said conductor bar being provided with a cast iron mantle, said electrode block defining a groove operable for receiving said conductor bar and said mantle, at least one lateral projection provided on said mantle and at least one recess defined in a sidewall of said groove into which said projection projects, whereby said cast iron mantle and therefore said conductor bar is anchored in said groove to restrain removal in an upright direction of said conductor bar from said electrode block.

3,867,563
REFINING APPARATUS AND PROCESSES

Reginald E. Laflin, Manor Royal, Crawley, Sussex, England

Filed May 24, 1973, Ser. No. 363,351
Claims priority, application Great Britain, May 26, 1972, 24928/72
Int. Cl. H05b *5/16*
U.S. Cl. 13—27 13 Claims



1. A coreless induction furnace comprising, in combination:
a refractory lining;
a single work coil surrounding said refractory lining;
said single work coil having first and second terminals one at each end of said single work coil;
a variable frequency electric power source;
a plurality of power factor capacitor units; and
switching means for connecting said first and second terminals to a selected one of said power factor capacitor units and to the output of said variable frequency electric power source.

3,867,564

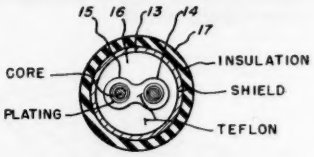
DUAL WIRE INTRUDER DETECTOR

Vahram S. Kardashian, Plymouth Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 371,435, June 19, 1973, Pat. No. 3,832,704, which is a continuation-in-part of Ser. No. 244,540, April 17, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 457,024

Int. Cl. H01b 7/18, 1/02

U.S. Cl. 174—36 3 Claims



1. An improved strain sensitive thin film plated wire assembly for use in a line sensor detection system, the improved plated wire assembly comprising:
- a first wire on which is plated an anisotropic thin film having a first composition of nickel-iron alloy plating which exhibits a first degree of magnetostrictive response;
- a second wire on which is plated an anisotropic thin film having a different composition of nickel-iron alloy plating which exhibits a different degree of magnetostrictive response;
- said first and second wires each having the same response to a magnetic field;
- insulative covering means enclosing said first and second wires, and
- metallic shielding means surrounding said first and second wires.

3,867,565

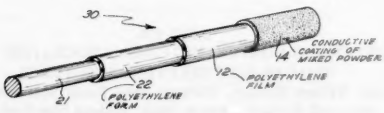
ELECTRICAL CONDUCTIVE COATED CABLE

Winslow W. Prentice, Pawcatuck, and Markay H. Malootian, Quaker Hill, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 393,534, Aug. 31, 1973,. This application Apr. 15, 1974, Ser. No. 460,854

Int. Cl. H01b 7/02

U.S. Cl. 174—120 SC 1 Claim



1. An electrical cable comprising:
- an electrical conductor;
- a first polyethylene cover enclosing said conductor;
- a second polyethylene cover enclosing and bonded to said first polyethylene cover; and
- an electrically conductive coating comprising a mixture of polyethylene powder, nickel powder and silver flake, said electrically conductive coating enclosing and bonded to said second polyethylene cover.

3,867,566

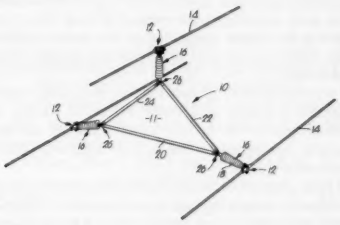
MIDSPAN ELECTRICAL CONDUCTOR SPACER

Paul E. Lewis, Mexico, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Mar. 12, 1973, Ser. No. 340,323

Int. Cl. H02g 7/12

U.S. Cl. 174—146 9 Claims



1. An adjustable midspan spacer for maintaining proximal high voltage conductors in spaced relationship, comprising:
- separate attachment means corresponding in number to said conductors and operable to grippingly engage one of the latter;
- a plurality of rigid insulative spacer bars interconnected to define a closed, generally planar, polygonal spacing assembly, said assembly being of dimensions permitting the positioning thereof within the space between said conductors and generally transversely of the longitudinal axes of the latter; and
- means adjustably connecting each of said separate attachment means to said spacing assembly at fixed, spaced locations thereon,
- said adjustable connector means permitting independent pivoting movement of each of said separate attachment means relative to said spacing assembly in the plane thereof and about said locations,
- said adjustable connector means also including mechanism for releasably locking each of said separate attachment means at desired orientations relative to said assembly and in the plane thereof.

3,867,567

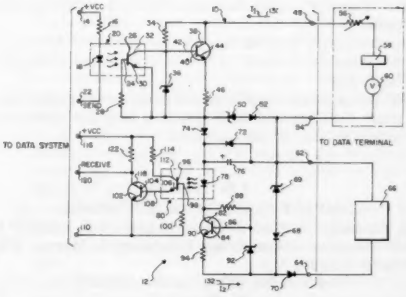
ELECTRONIC DATA TERMINAL INTERFACE

Roger G. Herron, Dunedin, Fla., and David B. Freitag, Bellevue, Wash., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 11, 1973, Ser. No. 405,374

Int. Cl. H04m 1/26

U.S. Cl. 178—3 7 Claims



1. An electronic data terminal interface circuit connected between a data system and a data terminal, said data terminal

including send driver means for recognizing data pulse signals in a code format, passive receive control means for providing mark and space pulse signals in a code format, and a dc power supply; said data system including send and receive signaling paths capable of recognizing and generating data pulses in a pulse train of code format; said electronic data terminal interface circuit comprising:

send channel means for providing level shifting, ground isolation and noise rejection having an input connected to the send signaling path output of said data system and having an output connected to the series combination of the driver means and the dc power supply of said data terminal,

and separate receive channel means providing level shifting, ground isolation and noise rejection having an input connected to the receive control means and having an output connected to the receive signaling path input of said data system,

said send channel means including electronic power storage means for supplying said separate receive channel means, said electronic power storage means being charged from the dc power supply of said data terminal.

3,867,568

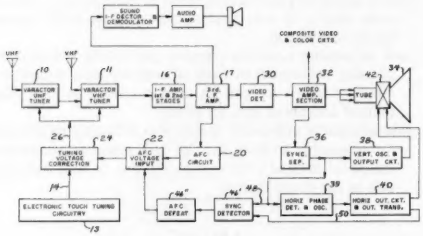
CONTROL CIRCUIT FOR AN AFC SYSTEM

Kenneth A. Merriweather, Evanston, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Dec. 4, 1972, Ser. No. 312,082

Int. Cl. H04n *5/50*

U.S. Cl. 178—5.8 AF **11 Claims**



1. In a receiver having tuner means for selecting a carrier signal having a recurring sync pulse and an information portion located between adjacent sync pulses, said carrier signal being located within a predetermined frequency passband, and an AFC circuit for varying the tuning of said tuner means to cause the receiver to lock onto the carrier signal, a control circuit comprising:

sync separator means for detecting said recurring sync pulse,

detector means coupled to said sync separator means for detecting the absence of a sync pulse within said passband, and

AFC defeat means coupled to said detector means for effectively disabling said AFC circuit in response to the detected absence of the sync pulse.

3,867,569

COMPACT FLATBED PAGE SCANNER

Hugh Alexander Watson, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 25, 1974, Ser. No. 445,051

Int. Cl. H04n *1/10*

U.S. Cl. 178—7.1 **2 Claims**

1. A compact flatbed scanner for facsimile scanning comprising:

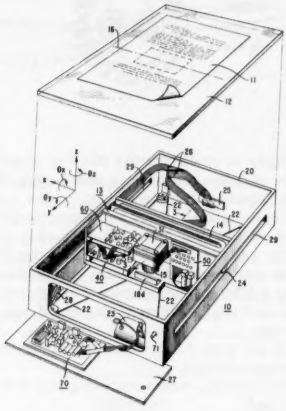
a. a housing;

b. a transparent plate mounted on the housing for supporting material to be copied, the transparent plate defining the approximate image plane of the material to be copied;

c. a moving scanning assembly supported within the housing beneath the transparent plate, the scanning assembly comprising:

1. at least one lamp for illuminating at least a portion of the image plane,

2. a linear charge coupled imaging device for detecting variations in intensity of light reflected from a scanning line on the image plane and having electrical contacts adapted to provide electronic scanning over the length of the scanning line, and



3. an optical system for focusing the light reflected from the scanning line onto the linear charge coupled imaging device, the optical system comprising a plurality of long, narrow mirrors for folding the optical path from the scanning line to the linear charge coupled imaging device;

d. means for mechanically displacing the scanning assembly relative to the image plane in a direction parallel to the image plane and perpendicular to the scanning line to permit scanning a succession of parallel lines from one end of the image plane to the other; and

e. electrical circuitry for sequentially reading out each scanning line detected by the linear charge coupled imaging device by forming an electrical signal representative of the variations in intensity of light reflected from the image plane along a succession of scanning lines.

3,867,570

SYSTEM FOR CONVERTING CINEMATOGRAPHIC FILM IMAGES INTO TELEVISION PICTURES

Peter William Blaxtan, Welwyn; John David Millward, Hitchin, and Richard Thomas Such, Bishops Stortford, all of England, assignors to Decca Limited, London, England

Filed Mar. 12, 1973, Ser. No. 339,971

Claims priority, application Great Britain, Mar. 14, 1972, 11861/72

Int. Cl. H09n *5/24;* **H04n** *5/88*

U.S. Cl. 178—7.2 **1 Claim**

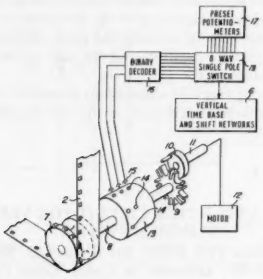
1. A system for converting cinematographic film images into television pictures, comprising:

an optical gate;

a cyclically and intermittently movable sprocket wheel for moving the frames of a cinematographic film through said optical gate;

a television camera including means for scanning a frame in said gate in a raster scan and a time base control network for shifting the position of a scanning raster in a pictorially vertical sense;

a plurality of potentioneters for storing a plurality of predetermined corrective signals, each denoting a predetermined error in the pictorially vertical positioning of a frame in the gate;



a cyclic selector means comprising a member having coded sets of indications, each indication corresponding to a tooth on the sprocket wheel; and

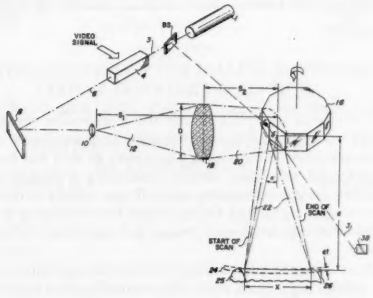
means for reading out said signals one at a time and feeding said signals comprising a decoder, a sensing means coupled to the decoder for detecting the indications and switch means, controlled by the decoder, for selecting the output of one of said plurality of potentiometers and for feeding the selected output to the time base network.

3,867,571

FLYING SPOT SCANNER

Gary K. Starkweather, Saratoga, and David E. Damouth, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 27, 1972, Ser. No. 309,861
Int. Cl. H04n *1/02*
U.S. Cl. 178—7.6 **14 Claims**



1. An electro-optical system for recording information from an electrical signal onto a scanned medium comprising:

means for providing a beam of high intensity light,

means for modulating the light beam in accordance with the information content of an electrical signal comprising a bit stream,

first optical means for expanding said modulated beam,

second optical means in convolution with said first optical means for imaging said expanded beam to a spot in a focal plane at a predetermined distance from said second optical means,

scanning means positioned between said second means and the focal plane for scanning the spot across a light sensitive medium in said focal plane to impart the information content of said spot to said medium, and

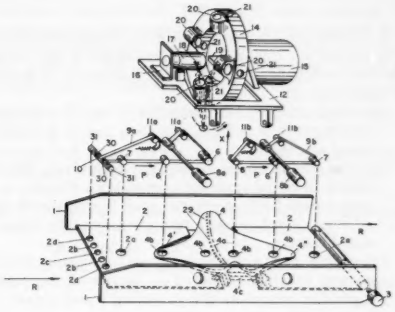
electrical means for synchronizing the transmission rate of the electrical signal to the velocity of the spot across the medium, said electrical means varying the number of bits per second in accordance with a predetermined function.

3,867,572

ELECTRO-OPTICAL READER FOR TRANSLATING PRINT INTO ELECTRIC SIGNALS

John F. Taplin, West Newton, and Richard W. Carman, Foxboro, both of Mass., assignors to Taplin Business Machines Incorporated, Burlington, Mass.

Filed June 1, 1973, Ser. No. 365,878
Int. Cl. H04n *1/24*
U.S. Cl. 178—7.6 **15 Claims**



1. An electro-optical reader for translating print on a document into electric signals including

a. arcuate means for imparting an arcuate shape to a document and means for moving the document in the direction of the axis of said arcuate means;

b. a single substantially linear stationary light source arranged in coaxial relation with the axis of said arcuate means;

c. a planar stationary array of light sensor means spaced from said linear light source in the direction of the axis of said linear light source, the plane defined by said array including said axis of said arcuate means;

d. a rotatable lens support having an axis of rotation arranged in coaxial relation with said linear light source but axially spaced from said linear light source;

e. a plurality of angularly displaced illuminating lenses fixedly mounted on said lens support for directing light emanating from said linear light source to successive points of a document;

g. a plurality of angularly displaced objective lenses fixedly mounted on said lens support for focusing images of said successive points of said document directly on said array; and

h. said plurality of illuminating lenses and said plurality of objective lenses being the only optical means interposed between said linear light source and said array determining the geometry of the path of light from said linear light source to said array.

3,867,573
TRACK TO TRAIN COMMUNICATION SYSTEMS

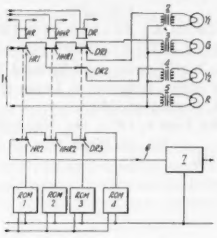
Michael Sambrook Birkin, London, England, assignor to British Railways Board, London, England

Filed Oct. 12, 1971, Ser. No. 188,065

Claims priority, application Great Britain, Oct. 23, 1970, 50520/70

Int. Cl. B61l *3/08*

U.S. Cl. 178—17.5 **2 Claims**



1. In a track-to-train communication system for transmitting information to a train related to the control of the running of the train in dependence upon the prevailing one of a plurality of signal aspects,

signal indicating means controlled to one of a plurality of conditions to indicate a prevailing one of a plurality of signal aspects,

a transmitter, having an output, for transmitting said information in digital code and comprising a plurality of non-destruct read-only memories each having stored therein information related to a respective one of a plurality of signal apsects,

and control means responsive to said indicating means for causing information stored in the one of the read-only memories related to the prevailing signal aspect to be transmitted.

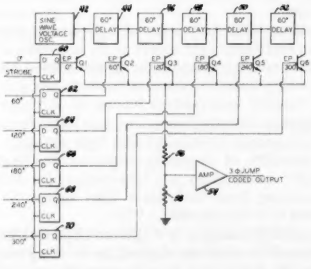
3,867,574
THREE PHASE JUMP ENCODER AND DECODER

Duane E. McIntosh, Santa Ynez, Calif., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 371,665, June 20, 1973, abandoned. This application Oct. 26, 1973, Ser. No. 410,271

Int. Cl. H04l *27/20*, *27/22*

U.S. Cl. 178—67 **15 Claims**



1. Apparatus for encoding binary data comprising:

storage means for storing at least two successive bits of said data;

clock means for entering said data into said storage means and for establishing the bit time interval of the encoded data,

carrier signal generating means, means for shifting the phase of the carrier signal by a first or second predetermined phase angle,

comparator means responsive to said clock means and to the state of said successive bits of data for detecting when said successive bits of data form the two bit configuration 11 or 00,

means responsive to the detection of the two bit configuration **11** for controlling said phase shifting means to cause said carrier signal to be shifted by said first predetermined phase angle and responsive to the detection of the two bit configuration **00** for causing said phase shifting means to shift the phase of said carrier by said second predetermined phase angle,

means for inhibiting said comparator means for one bit time interval following detection of the two bit configuration 11 or 00.

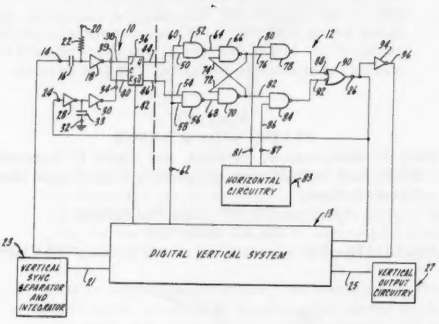
3,867,575
DIGITAL ANTI-JITTER CIRCUIT FOR VERTICAL SCANNING SYSTEM

Walter S. Ciciora, Park Ridge, and Richard G. Merrell, Darien, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed June 22, 1973, Ser. No. 372,558

Int. Cl. H04n *5/04*

U.S. Cl. 178—69.5 TV **6 Claims**



1. A digital anti-jitter circuit for a television receiver intended to utilize a telecast including horizontal and vertical synchronization information which may or may not be phase locked, said television receiver including a digital vertical scanning system comprising vertical sync means to develop a vertical sync signal and timing means for developing a timing signal related to horizontal timing, said anti-jitter circuit comprising:

phase determination means, coupled to said timing means, producing a clock signal for controlling said digital vertical scanning system;

jitter detection means, having a vertical sync input coupled to said vertical sync means having a clock input coupled to said phase determination means, for comparing the time relationship between said clock signal and said vertical sync signal to develop a control signal indicative of the occurrence of a potential vertical jitter condition;

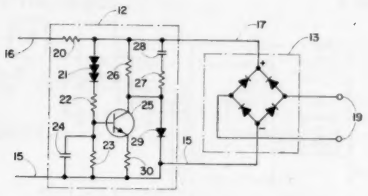
said phase determination means having a control input coupled to said jitter detection means for receiving said control signal

and including means for reversing the phase of said clock signal whenever said control signal indicates the occurrence of a potential jitter condition.

3,867,576
TELEPHONE TRANSMITTER CIRCUIT

Karlo Buchvaldt Simonsen, London, Ontario, Canada, assignor to Northern Electric Company, Limited, Montreal, Quebec, Canada

Filed Dec. 14, 1973, Ser. No. 424,850
Int. Cl. H03f *1/34*
U.S. Cl. 179—1 A **3 Claims**



1. A telephone transmitter having terminals for connection to a telephone line having a direct current voltage applied thereto remote from the terminals, comprising:

a self-polarized microphone;

a semiconductor amplifier having a substantially constant output impedance and responsive to the output of the microphone to cause fluctuations in the current carried by the telephone line;

a direct current voltage divider connected across said terminals and having a voltage tap, the voltage divider including a plurality of serially connected diodes, the forward conduction characteristics of the diodes restricting current flow through the voltage divider below a particular operating voltage at the terminals, thereby providing a control voltage at said voltage tap which is proportional to the operating voltage above said particular operating voltage;

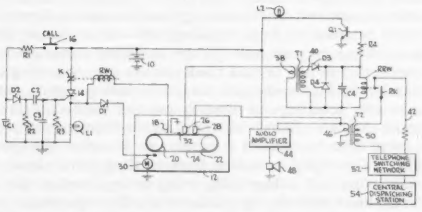
a variable impedance alternating current shunt connected across the terminals and to the voltage tap, the impedance of the shunt being controlled by and in proportion to the control voltage;

the impedance of the shunt and the output impedance of the amplifier co-acting to substantially duplicate the acoustical to electrical conversion efficiency of a typical carbon telephone transmitter over its operating current range.

3,867,577
AUTOMATIC SYSTEM FOR DIALING A CENTRAL TAXICAB DISPATCHING STATION

Donald Herrington, 3101 College Ave., Costa Mesa, Calif. 92626

Filed June 11, 1973, Ser. No. 368,880
Int. Cl. H04m *11/00*
U.S. Cl. 179—2 R **10 Claims**



1. Apparatus for automatically dialing a central taxicab dispatching station on a telephone line comprising:

recorder means including tape means for storing a line seizing signal for seizing the telephone line, a dial signal corresponding to pulses for dialing the central taxicab dispatching station, a line holding signal and an audio message in parallel with said line holding signal, and pick-up means for supplying electrical signals corresponding to said line seizing and dial signals and said audio message;

relay circuit means coupled with said pick-up means for supplying said line seizing and dial signals to the telephone line;

transformer means coupled with said pick-up means for supplying said audio message to the telephone line and to permit audio communication between a caller and the central taxicab dispatching station;

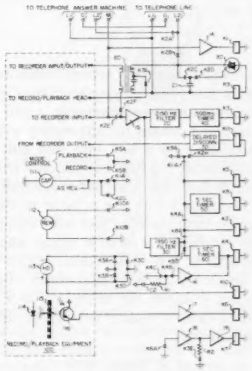
switch means for operating said recorder means when actuated by a caller to supply said line seizing and dial signals to said relay circuit means to establish communication with the central taxicab dispatching station and to supply said audio message to said transformer means for communication to the central taxicab dispatching station; and

transducer means coupled with said transformer means to permit the caller to hear audio messages from the central taxicab dispatching station and to supply audio messages to the central taxicab dispatching station whereby actuating said switch means, the central taxicab dispatching station is automatically dialed, said audio message is automatically communicated to the central taxicab dispatching station and two-way communication between the caller and the central taxicab dispatching station is automatically established.

3,867,578
ADAPTER FOR AUTOMATIC TELEPHONE ANSWERING DEVICES PERMITTING REMOTE MONITORING OF RECORDED MESSAGES

Francis Y. Uechi, New Berlin, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 28, 1973, Ser. No. 401,800
Int. Cl. H04m *11/00;* **G11b** *5/00*
U.S. Cl. 179—6 E **6 Claims**



1. In combination a telephone line, a telephone answering and recording machine, said machine initially connected to said telephone line and rendered operated in response to receipt of an incoming call over said telephone line, and an adapter, said adapter including: record and playback equipment operable in record, playback and rewind modes; monitor means connected between said machine and said record and playback equipment, operated in response to said machine receiving an incoming message over said telephone line, to operate said record and playback equipment in the record

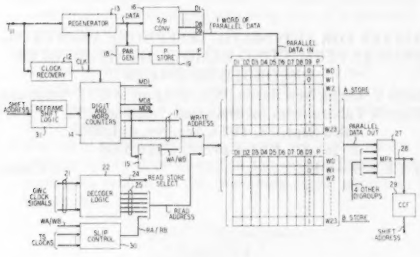
mode; first signal detection means connected between said monitor means and said record and playback equipment, initially operated in response to receipt of a first tone signal of a first predetermined frequency received over said telephone line, to disconnect said machine from said telephone line, connect said telephone line to said record and playback equipment and operate said record and playback equipment in the playback mode; second signal detection means connected between said telephone line and said record and playback equipment initially operated in response to receipt of a tone signal of a second predetermined frequency received over said telephone line to operate said record and playback equipment in the rewind mode; said second signal detection means further operated in response to termination of said tone signal of said second predetermined frequency to terminate operation of said record and playback equipment in the rewind mode and reoperate said record and playback equipment in the playback mode.

3,867,579

SYNCHRONIZATION APPARATUS FOR A TIME DIVISION SWITCHING SYSTEM

John Robert Colton, Freehold, and Henry Mann, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1973, Ser. No. 427,068
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 A **8 Claims**



1. A time division switching system comprising a plurality of incoming lines, each line serving to carry digital data signals in time division multiplexed channels, a pair of receive data stores for each line, means for alternately writing the successive frames of data on a line into said pair of data stores, means for alternately reading out the data from each store in a manner such that the read out from one store generally occurs simultaneously with the write in to the other, control means for comparing the read and write store cycles for each line and for producing a control signal when the read and write cycles drift to a predetermined extent relative to each other, and means for coupling said control signal to the store read out means to cause the same to skip a frame of stored data or double-read a frame depending upon the relative direction of said drift.

3,867,580

RECEIVING CIRCUITS FOR DIGITAL SIGNAL DISTRIBUTION SYSTEMS

Stanley L. Russell, West Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

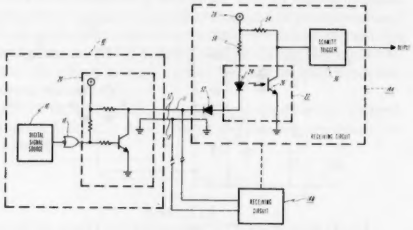
Filed Dec. 29, 1972, Ser. No. 319,244
Int. Cl. H04b *3/36, 15/00*
U.S. Cl. 179—16 EA **7 Claims**

6. A signal distribution system comprising:

a cable pair;

a source of digital signals connected to apply digital signals to said cable pair;

a plurality of receiving circuit means, each including an optoelectronic coupler circuit having a light emitting diode and a photosensitive transistor located proximately to said diode and being optically coupled thereto, connected to said cable pair; wherein the diodes are connected in a direct current circuit between one lead of said cable pair and power supply terminals of corresponding



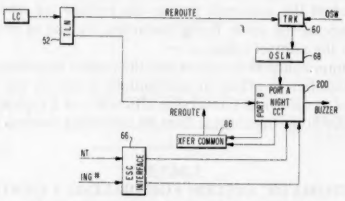
receiving circuits and the transistors are connected between said power supply terminals and the other lead of said cable pair said other lead defining a ground wire between the signal source and the plurality of receiving circuits; the arrangement being such that said transistors repeat the digital signals received from said cable pair when applied to said diodes.

3,867,581

UNIVERSAL NIGHT SERVICE CIRCUIT

Uwe A. Pommerening, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,449
Int. Cl. H04m *3/54*
U.S. Cl. 179—18 BD **26 Claims**

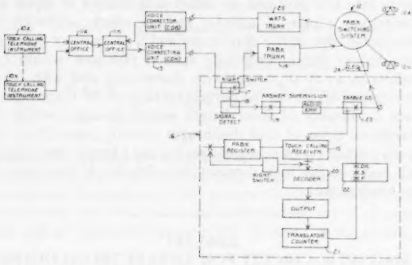


1. In a private automatic branch exchange including central office equipment provided with a plurality of line circuits, said central office equipment being interconnected with private branch equipment provided with a plurality of trunk circuits, an operator complex and transfer means for effecting transfer of an incoming communication connection of a trunk circuit from a first line circuit to a second line circuit in said central office equipment, a universal night service circuit comprising signal means actuating a signaling indicator, a dummy load, control means responsive to an incoming communication connection at one of said trunk circuits for connecting said dummy load to said trunk circuit including signal control means for actuating said signal means upon connection to said trunk circuit, a calling bridge relay arrangement, means in said central office equipment responsive to detection of a special dialed digit signal generated from a selected line circuit for connecting said calling bridge relay arrangement to said selected line circuit through said central office equipment, storage means for storing the identification of said selected line circuit and means responsive to connection of said calling bridge relay arrangement to said selected line circuit for actuating said transfer means to connect said trunk circuit to the line circuit whose identification is stored in said storage means through said central office equipment.

3,867,582
REMOTE CONTROL FOR PRIVATE AUTOMATIC BRANCH TELEPHONE EXCHANGE

Robert P. Weed, Prairie Village; Gary Rosenberg; Quentin Bourkland, both of Overland Park, all of Kans., and Robert E. Overby, Harrisonville, Mo., assignors to United Business Communications, Inc., Shawnee Mission, Kans.

Filed June 12, 1973, Ser. No. 369,405
Int. Cl. H04m *3/54*
U.S. Cl. 179—18 BE **5 Claims**



1. In a telephone communication system having a central switching exchange and subscriber stations equipped with telephone instruments for multi-frequency tone signaling representative of digits displayed on the instrument, the combination therewith of

an automatic private branch exchange,

a communication channel to said branch exchange from said central exchange,

a tone signal receiver associated with said branch exchange and operable to translate tones keyed from said subscriber instruments to a plurality of output pulse patterns corresponding to and indicative of the discrete tones generated at said subscriber instruments, and

control means connected with said channel and said receiver and operable upon reception of a preselected combination of output pulse patterns from said receiver to switch said channel into said branch exchange to enable route switching within the branch exchange under the control of the tone signals keyed at said subscriber instrument.

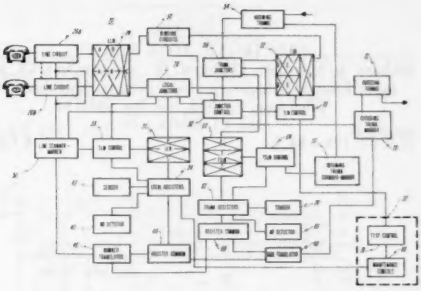
3,867,583
CONTROL SYSTEM FOR SWITCHING NETWORKS

Alton Dorazio, Jr., East Rochester; Otto Altenburger, and Gunter F. Neumeier, both of Rochester, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed July 27, 1973, Ser. No. 383,357
Int. Cl. H04q *3/42*
U.S. Cl. 179—18 E **10 Claims**

1. In a multistage switching network of the type providing a plurality of paths through grouped links for interconnecting circuits connected to opposite ends of the network, an improved control system locating and completing free paths through said network between marked circuits at opposite ends of the network, the control system including a plurality of scanners each having a plurality of scan lines, each of the scan lines associated with a portion of the paths, the scanners including means for generating a plurality of scan pulses in succession, the generating means including means for applying the scan pulses each to a different one of the plurality of scan lines, and means for enabling the plurality of scanners in sequence to identify path portions including one of the links of a unique one of the free paths between the marked circuits, the improvement comprising:

means associated with each of the scan lines for receiving one of the scan pulses, means connected to the receiving means and responsive to the one scan pulse for connecting the associated path portion of the network, to the scanner; and

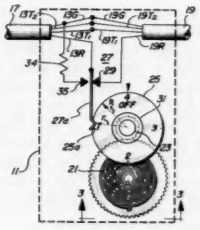


means connected to each of the receiving means of at least one of the scanners for selectively inhibiting all but one of the connecting means associated with the at least one scanner.

3,867,584
DO-NOT-DISTURB ADAPTER FOR TELEPHONE RECEIVERS

Wayne E. Rengren, Wood Dale, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed July 16, 1973, Ser. No. 379,280
Int. Cl. H04m *1/21*
U.S. Cl. 179—84 C **1 Claim**



1. In a telephone system having a ring control line for conducting ringing signals to a telephone receiver, apparatus comprising:

a switch connected to the ring control line, said switch including a first and second contacts, said switch moveable between said contact position and connecting the ring control line to the ringer of said telephone receiver in said first contact position;

a resistor substantially equal to the telephone receiver ringer impedance connected between said second contact and ground, said resistor coupling the ringing signals to ground whenever said switch is placed in said second contact position;

a plurality of cams having substantially circular peripheral edges, each of said peripheral edges having at least one indentation therein;

means for rotating said cams at a predetermined rate for a selectable time interval comprising a mechanical timer, said timer including a rotatable shaft coupled to said timer, said cams being mounted on said rotatable shaft; and

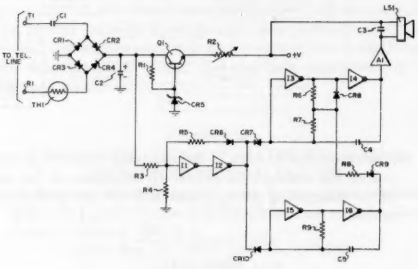
means for moving said rotatable shaft longitudinally to selectively engage one of said cams along said peripheral edge with said switch;

said cam opening and closing said switch between said first and second contact positions as said peripheral edge of said selected cam moves past said switch.

3,867,585
ELECTRONIC TONE RINGER

Richard A. Morstadt, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 2, 1973, Ser. No. 385,134
Int. Cl. H04m *1/00*
U.S. Cl. 179—84 T **8 Claims**

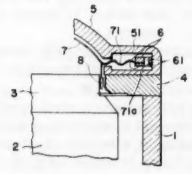


1. A tone ringer for use in a telephone subset connected to a telephone line, comprising: a rectifier circuit connected to said telephone line, operated in response to ringing signals received over said telephone line, to convert said ringing signals to direct current potential; a first oscillator circuit connected to said rectifier, and including a plurality of frequency determining components, operated in response to said d.c. potential from said rectifier to generate tone signals at a first frequency; a second oscillator circuit connected to said rectifier circuit and including a circuit connection to said first oscillator circuit, operated in response to said d.c. potential from said rectifier to periodically shunt at least one of said plurality of frequency determining components in said first oscillator; said first oscillator further operated in response to each shunting of at least one of said frequency determining components, to generate a tone at a second frequency; and a transducer connected to said first oscillator operated in response to generation by said first oscillator of tones of said first and second frequencies to audibly reproduce said tones.

3,867,586
LOUDSPEAKER WITH FLAT FREQUENCY CHARACTERISTICS

Kouji Maekawa, and Yutaka Tamura, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 19, 1972, Ser. No. 298,907
Claims priority, application Japan, Oct. 19, 1971, 46-82095
Int. Cl. H04r *1/28, 1/30, 9/06*
U.S. Cl. 179—115.5 H **3 Claims**

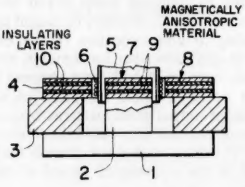


1. In a loudspeaker construction forming a horn type speaker or the like and including; a casing having an annular plate concentrically surrounding a circular magnet and forming an annular air gap therebetween, a diaphragm having a central portion overlying said magnet, a cylindrical voice coil support extending from the side of the diaphragm facing the magnet and concentrically carried within said annular gap, and an integral peripheral edge portion of the diaphragm overlying said annular plate, a cover overlying the side of said diaphragm not facing the magnet, the improvement comprising: means including at least said cover defining an annular cavity receiving the peripheral edge only of said diaphragm, means for fixing said diaphragm to said casing solely at its peripheral edge with said peripheral edge portion dividing said cavity into two portions on either side thereof of equal size comprising a pair of annular gaskets which sandwich the peripheral edge of the diaphragm and a plurality of holes are provided at circumferentially spaced positions within said gaskets in axial alignment with themselves and with corresponding holes within the peripheral edge of the diaphragm to form a plurality of short length sound passages within the peripheral edge of said diaphragm directly connecting said cavity portions with said passages having a length less than the half wave of the high reproduction threshhold frequency of the loudspeaker.

3,867,587
MAGNETIC CIRCUIT FOR AN ELECTRO-ACOUSTIC CONVERTER

Isao Yamamuro, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 18, 1972, Ser. No. 315,970
Claims priority, application Japan, Dec. 17, 1971, 46-102518
Int. Cl. H04r *9/02*
U.S. Cl. 179—115.5 R **2 Claims**



1. An electro-acoustic converter comprising:
a. a center pole;
b. voice coil means surrounding said center pole;
c. magnetic means surrounding said center pole and said voice coil means; and
d. plate means fixed to said magnetic means; the improvement comprising
e. wherein at least a portion of said center pole is a stack of layers of a magnetically anisotropic material interleaved with insulating layers;
f. wherein at least a portion of said plate means is a stack of layers of a magnetically anisotropic material interleaved with insulating layers.

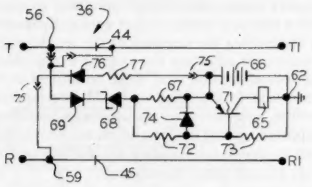
3,867,588
QUICK DISCONNECT FOR TELECOMMUNICATION LINES

Herman Leon Pickens, and Thomas P. Miller, both of Jackson, Tenn., assignors to Terra Corporation, Jackson, Tenn.

Filed June 1, 1973, Ser. No. 365,831
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 R **17 Claims**

1. A system for operating a remote disconnect device for opening a line at a distant location and thereby removing attachments therefrom, said line extending from a central office to equipment at said distant location, said system com-

prising means for transmitting a signal from the central office over said line to said distant location for a selected period of time, means local to the distant location for there disconnecting said line at a point between the said central office and all of the equipment at the distant location for a period of time



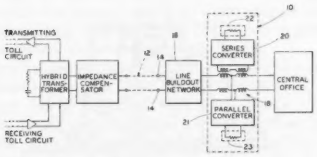
which is dependent upon the duration of said signals on the line, and means whereby said disconnect means is operated during said disconnect period independently of all potentials on said line whereby said line may be tested free of all potentials and all equipment not directly involved in the testing.

3,867,589

ENHANCING IMPEDANCE CHARACTERISTICS OF NEGATIVE IMPEDANCE REPEATERS OPERATING AT HIGH GAIN

Peter G. Junek, Raleigh, N.C., assignor to Astrocom Division of Q.C.P. Ltd., Walhalla, N. Dak.

Filed Sept. 4, 1973, Ser. No. 393,982
Claims priority, application Canada, Aug. 8, 1973, 178303
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.31 R **9 Claims**



1. A process for aligning a telephone repeater of the type including both series-connected and shunt-connected negative impedance converters, each converter being provided with a strapping network of interconnectable resistors, said repeater being provided with line terminals for connecting said repeater in series with a two-wire transmission link having a predetermined nominal impedance, said process comprising, in combination, the steps of;

connecting first and second temporary terminating resistance circuits to said series-connected and said shunt-connected converters respectively, each of said circuits having a fixed resistance component for setting the overall gain of said repeater at a predetermined level and 'a variable resistance component for altering the impedance characteristics of said repeater without substantially changing its gain;

terminating said line terminals of said repeater with said predetermined nominal impedance;

connecting a return loss measuring device to the repeater thus terminated;

adjusting the value of said variable resistance component until the return loss as indicated by said measuring device is substantially maximized; and

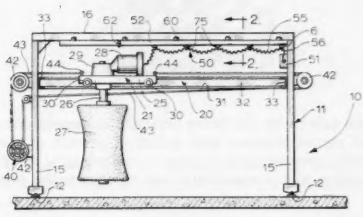
interconnecting in each of said strapping networks a permanent fixed resistor having a value substantially equal to the value of said variable component in the corresponding one of said temporary circuits at the time said measured return loss is maximized.

3,867,590

CABLE CARRIER

William James Gasser, Long Grove, Ill., assignor to Brite-O-Matic Manufacturing, Inc., Arlington Heights, Ill.

Filed Oct. 29, 1973, Ser. No. 410,601
Int. Cl. H02g *11/00*
U.S. Cl. 191—12 R **4 Claims**



1. A cable carrier assembly for handling a power cable between a fixed power source terminal on a support frame and a carriage mounted for travel on the frame, comprising:

a. elongated track means on said frame,

b. said track means comprising an inverted channel member including depending leg flanges which are formed inwardly at their lower, free ends, to define a slot narrower than said channel member,

c. a section of said power cable being coiled and resiliently extensible from a compact, retracted length to an extended length,

d. a plurality of slide units mounted on said track means for longitudinal movement relative thereto,

e. each of said slide units extending through said slot and suspended from said inwardly formed, lower free ends of said leg flanges,

f. each of said slide units comprising a base and a cap,

g. said caps being retained within said channel member by said free ends of said leg flanges and said bases being suspended below said free end,

h. said bases and said caps having opposed, generally segmentally spherical surfaces formed thereon whereby said slide units can tilt in said slot and still slide relative thereto without binding, and

i. each of said slide units including means fastening it to said cable section whereby retraction and extension of said cable section as said carriage travels relative to said frame is accommodated while said cable section is held immediately adjacent said track means between said slide units.

3,867,591

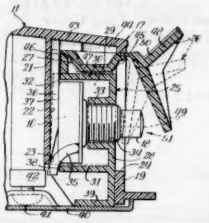
ONE PIECE SWITCH HOLDER AND FOOT OPERATED HINGE ACTUATOR FOR VACUUM CLEANER SWITCH

Erwin E. Nordeen, St. Paul., Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 16, 1974, Ser. No. 433,920
Int. Cl. H01h *3/14, 9/02*
U.S. Cl. 200—52 R **13 Claims**

1. In an electrical device having an electrical switch provided with a projecting actuator portion, the improvement comprising: wall means on said device defining a cavity having an insertion opening and exposure opening; and a one-piece combination switch holder and switch operator element inserted through said insertion opening to be removably received in said cavity, said element having a firs portion defining switch holding means carrying the electrical switch in said cavity with the actuator portion exposed through said exposure opening of the cavity, a second portion defining an en-

gagement means for selectively engaging said exposed actuating portion of the switch, and a third portion defining hinge means hingedly connecting said engagement means to said switch holding means, said hinge means including a portion



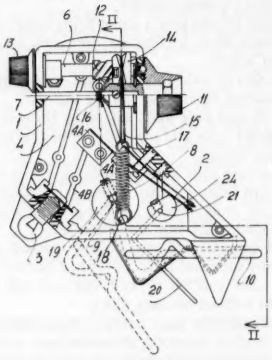
within said cavity and being arranged to dispose said engagement means adjacent said actuating portion of the switch whereby preselected movement of said engaging means causes operation of said actuating means to operate the switch.

3,867,592

STOP MOTION SWTICH FOR CONTROLLING THREAD TENSION IN A TEXTILE MACHINE

Antonio Sala Quellos, Lepanto Street No. 56, Mataro, Spain

Filed Dec. 14, 1973, Ser. No. 424,788
Claims priority, application Spain, Dec. 14, 1972, 409991
Int. Cl. B65h *25/14*
U.S. Cl. 200—61.18 **10 Claims**



1. In an electro-mechanical stop motion device for use with a textile machine for controlling the tension in a traveling thread, including a casing, a pair of relatively movable contacts mounted in said casing and adapted when closed to complete both an operating circuit for stopping the textile machine and a supply circuit of an externally visible indicating lamp, a shaft mounted on the casing and supporting an angularly movable gravity-actuated thread feeler located externally of the casing, said thread feeler being operatively connected to the contacts for controlling the position thereof and being normally maintained in an uppermost position when supported on the thread wherein said contacts are opened, a thread tensioning arm swingably supported on said casing and movable between a first position for engaging said tensioning the thread and a second position for releasing the tension on the threads, and an over-center spring device mounted on said casing and connected to said thread tensioning arm for normally maintaining said arm in either of said first or second positions, movement of said arm between said first and second positions causing same to be moved about a center point through an intermediate unstable position, said over-center spring device including a tension spring which is subject to imposition of a maximum tension thereon when said device is in said intermediate unstable position, the improvement comprising:

printed circuit board means mounted in said casing and defining thereon circuitry means connected to said indicating lamp and said relatively movable contacts, said circuitry means also being connected to electrical connector contacts which project externally from said casing for controlling the stopping of the textile machine;

first means for adjusting the angular extent through which said thread tension arm must be moved in moving between said first portion and said intermediate unstable position, said first means including a first shaft movably supported on said casing and means interconnecting said shaft to said tension spring for shifting said spring relatively to said center point; and

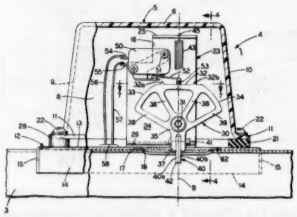
second means for adjusting the tension in said tension spring, said second means including a second shaft movably supported on said casing and means interconnecting said shaft to said tension spring, said second shaft being disposed substantially parallel to said first shaft.

3,867,593

PNEUMATIC TUBE CARRIER DETECTOR ASSEMBLY WITH CAM OPERATED MICROSWITCH AND RESILIENT FINGER HEELER MEANS

John C. Kryah, and Charles B. Barnett, both of Akron, Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Nov. 7, 1973, Ser. No. 413,612
Int. Cl. H01h *3/16*; B65g *51/36*
U.S. Cl. 200—61.41 **13 Claims**

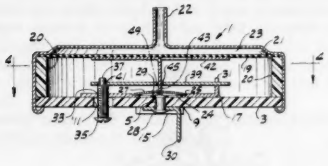


1. Detector construction for detecting the passage of a carrier moving through a pneumatic tube of a type in which a slot is formed in the tube including, generally airtight housing means mounted on the pneumatic tube covering the tube slot; cam means; pin means pivotally mounting the cam means within the housing means for rotation of the cam means from an at-rest position counterclockwise to a first deflected position and clockwise to a second deflected position; switch means mounted within the housing means and adapted to be engaged by and actuated by the cam means when the cam means is in either of said deflected positions, said switch being unactuated when said cam means is in the at-rest position; finger means mounted on the cam meanns and extending through the tube slot into the interior of the tube; a carrier moving in either direction through the tube striking the finger means thereby rotating said cam means to one of said two deflected positions for actuating the switch means; and said finger means being formed of flexible, semi-rigid wear resistant material composed of an elastomer impregnated woven fabric, whereby the finger means has sufficient flexibility to absorb carrier impact and sufficient rigidity to rotate the cam means when struck by a moving carrier.

3,867,594
PRESSURE SENSITIVE SWITCH WITH DIAPHRAGM AND DISH CONTACT MEANS

Paul E. Graf, Foxboro, and Daniel R. Pimentel, Seekonk, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1973, Ser. No. 420,024
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 P **5 Claims**



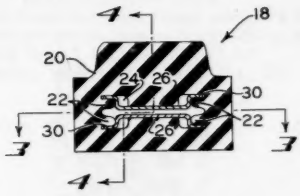
3. A pressure sensitive switch comprising:
an insulative base;
a first electrical contact carried by said base;
a second electrical contact comprising a resilient deformable dish-shaped conductive elemet movable in response to selected force applied thereto to abruptly change its shape from a first curvature to a second curvature wherein it is movable in response to a selected decrease in said force applied thereto to abruptly change from its second curvature and return to its first curvature;
an electrically conductive support secured at one surface of said base, said support having a recess therein receiving and loosely holding the dish-shaped second contact element around its periphery normally supporting the element in its first curvature disposition bowed away from said first contact to be moved into electrical engagement with said first contact when said dish-shaped element is moved to its second curvature disposition in response to said selected force being applied thereto;
a resilient diaphragm deformable in response to a difference in pressures on the opposite surfaces thereof, said diaphragm being mounted with one surface thereof in spaced facing relation to said one base surface for exposing the other surface of said diaphragm to varying fluid pressures; and
a rigid stem fixedly secured to said diaphragm for coextensive movement with said diaphragm and extending from said one diaphragm surface into engagement with said dish-shaped second contact element to directly apply force to said second contact element in response to deformation of said diaphragm, whereby selected deformation of said diaphragm in response to a predetermined pressure differential applied to opposite surfaces of said diaphragm applies said selected force to said second contact and is effective to move said second contact to its second curvature disposition to engage said first contact.

3,867,595
SINGLE CONTACT ACTUATOR ASSEMBLY

Ira E. Ramsey, and Byron L. Fishbaugh, both of St. Marys, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 10, 1973, Ser. No. 423,038
Int. Cl. H01h *13/16*
U.S. Cl. 200—86 R **12 Claims**

1. A contact actuator providing an on/off function in an electrical circuit, the actuator comprising:
A. an elastomeric housing member defining a chamber having an open end, said housing member having a pair of integrally formed cantilever ledges on each of opposing sides of the chamber, protruding into the chamber, and extending at least the partial length thereof;
B. a pair of U-shaped conductor plates juxtaposed within the chamber in opposed parallel position, said plates having tab extensions along the lateral edges thereof, the inner portion of the U-shape being in abutting relationship with the housing member while the outer portion provides a contact surface for close circuiting the actuator, said plates slidably received along their lateral edges

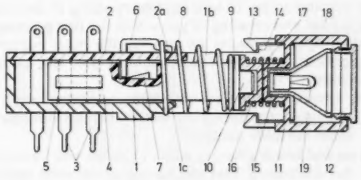


by at least one pair of opposing cantilever ledges and constrained within the chamber by their relationship with the ledges; and
C. an elastomeric plug adapted to fit securely within the open end of the housing chamber to seal the chamber, said plug providing access to the conductor plates for connection to the electrical circuit.

3,867,596
ALTERNATE MAKE-BREAK PUSHBUTTON SWITCH ASSEMBLY WITH DETENT MEANS, INDICATOR AND INDICATOR SLIDE SWITCH STRUCTURE

Rudolf Schadow, Konigsbacher Zeile 23, 1 Berlin 28, Germany

Filed July 27, 1973, Ser. No. 383,332
Claims priority, application Germany, Sept. 6, 1972, 2243639
Int. Cl. H01h *13/66, 3/20, 9/18*
U.S. Cl. 200—153 J **14 Claims**



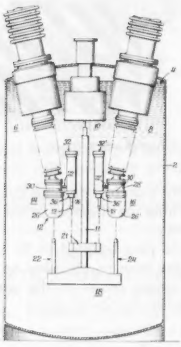
1. A push button switch, comprising:
a housing; fixed contacts carried on said housing;
a switch plunger positioned in said housing; said plunger having an axis extending along said housing and said plunger being axially shiftable along said axis through said housing; bridging contacts carried on said plunger and movable therewith through said housing and positioned to be engaged with said fixed contacts;
a plunger return spring in engagement with said plunger to bias same axially in a direction toward a push button;
detent means engaging said plunger for holding same nonmovably against the biasing of said plunger spring;
a push button located and oriented to engage said plunger; said push button being shiftable axially of said plunger to shift said plunger axially in opposition to said plunger spring, said push button being supported by said housing and being separate from and movable independently of said plunger;
a push button return spring separate from said plunger return spring and connected with said push button and normally biasing said push button axially of and away from said plunger.

3,867,597

CONTACT OPENING MEANS FOR A CIRCUIT BREAKER

Melbourne G. Jawelak, and Richard R. Boni, both of McMurray, Pa., assignors to McGraw-Edison Company, Elgin, Ill.

Filed July 26, 1972, Ser. No. 275,332
Int. Cl. H01h 33/68
U.S. Cl. 200—150 R 2 Claims



1. In a circuit breaker including main stationary and movable contact structures, the main movable contact being movable to open and closed positions relative to the main stationary contact structure, said contact structures carrying current when in said closed position and interrupting current while moving from the closed to the open position, a first housing containing dielectric fluid and enclosing said stationary and movable contacts when the contacts are in their closed position, the movement of the movable contact to the open position causing arcing of said current resulting in decomposition of the fluid and creating of gas within the first housing, a main contact opening means for moving the main contact out of engagement with the stationary contact, the combination comprising:

an auxiliary spring for providing additional main contact opening force during the initial opening movement of the main movable contact;

a second housing having a first chamber and a second chamber containing fluid and having an enclosed fluid connection with the first housing;

a piston slidable in the directions of the main movable contact and being positioned within the second housing, said piston having a piston rod extending from the second housing into engagement with the main movable contact structure;

The first chamber of the second housing being positioned on one side of the piston and the second chamber of the second housing being positioned on the other side of the piston, said auxiliary spring being positioned within the first chamber and biasing the piston and piston rod in the direction of opening movement of the main movable contact and the piston rod against the auxiliary movable contacts; and

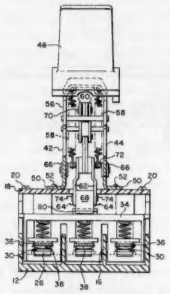
said gas and fluid within the first housing flowing through said fluid connection into said second chamber, said piston and piston rod moving in the direction of the first chamber against the bias force of the auxiliary spring and the piston rod moving out of engagement with the main movable contact structure in response to flow of the gas and fluid from the first housing into the second chamber whereby the opening force of the auxiliary spring provided to the main movable contact is retarded.

3,867,598

CONTROL SWITCH

Edward L. Richards, Aliquippa, and Stephen S. Dobrosielski, Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1973, Ser. No. 404,579
Int. Cl. H01h 3/46
U.S. Cl. 200—153 G 11 Claims



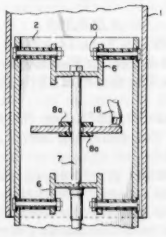
1. A switch device comprising an electrically insulating housing having housing walls, at least one of the walls having an opening, a stationary contact structure within the housing, a movable contact structure within the housing and being movable rectilinearly between open and closed positions relative to the stationary contact structure, operating mechanism for the movable contact structure external of the housing and comprising an operating lever and a switch handle thereon for manually moving the operating lever, the operating mechanism also comprising an overcenter toggle operable by the operating lever to effect movement of the movable contact structure, a connecting member operatively connected between the movable contact structure and the overcenter toggle, the connecting member extending through said opening and comprising upper and lower toggle links and the lower toggle link being pivotally connected to the connecting member, the upper and lower toggle links being movable arcuately, the overcenter toggle also comprising spring means extending between the pivotal connection to the connecting member and the lever adjacent to the switch handle.

3,867,599

DOUBLE ACTING SLIDE SWITCH ASSEMBLY WITH TELESCOPICALLY ARRANGED HOUSINGS AND NORMALLY CENTERED MOVABLE CONTACT

George A. Moen, Spenard, Anchorage, Alaska 99503

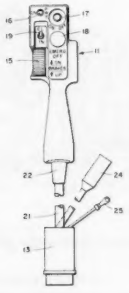
Filed Apr. 12, 1973, Ser. No. 350,541
Int. Cl. H01h 15/06, 17/00
U.S. Cl. 200—153 K 4 Claims



1. Double-acting switch means for an electrical warning device, comprising

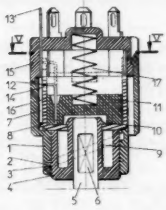
a. a pair of telescopic housing sections (**1, 2**) connected for axial displacement relative to each other;
b. a conductive guide rod (**7**);
c. a pair of stationary contacts (**6**) connected with the ends of said guide rod, respectively, for supporting said guide rod in axially arranged relation within a first one of said sections;
d. a movable contact (**8**) arranged for movement between said stationary contacts;
e. hanger means (**9**) connecting said movable contact with the other of said sections, whereby as said housing sections are axially displaced between predetermined positions relative to each other, said movable contact is brought into direct electrical contact with one of said stationary contacts and into electrical connection with the other of said stationary contacts via said guide rod; and
f. spring means (**13**) biasing said sections toward a given position relative to each other.

3,867,600
HAND-HELD CONTROL MEANS
Carroll D. Phillips, Weston, Mass., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 17, 1973, Ser. No. 361,391
Int. Cl. H01h *9/02*; **H02b** *1/08*
U.S. Cl. 200—157 **3 Claims**



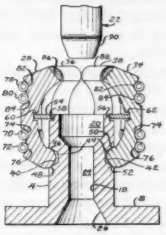
1. A hand-held device for controlling the operation of powered equipment by the natural movements of an operator's thumb comprising:
a handle grip member having a lower portion contoured to be comfortably gripped by the fingers of the right hand of the operator and an angular control portion extending from the handle grip lower portion and having specific control components deployed within ready reach of the thumb of said right hand;
said lower portion tapering from a wider base area remote from said control portion to a narrower area adjacent said control portion for more securely accomodating the operator's right index finger;
said control components including a rotatable control knob in the lower left quadrant of said angular control portion immediately above the operator's right thumb for permitting variable control of equipment connected thereto;
a toggle switch disposed immediately above said rotatable control knob for selecting the circuits to be thumb-controlled thereby; and
ON-OFF recessed pushbutton controls opposite said toggle switch for starting and stopping by thumb action the operation of the equipment to which said device is connected,
said control components being recessed within the outer configuration of the control portion so that accidental actuation of the control member either by the operator's thumb or by other means is avoided; and
a control cable having a plurality of connectors therein removable received axially in said lower portion at the ends thereof remote from said control portion.

3,867,601
ELECTRIC MULTIPOLAR ROTATABLE SWITCH WITH HELICAL ROTOR DRIVE
Paul Lipschutz, Croissy-Sur-Seine, France, assignor to Societe d'Exploitation des Brevets Neiman, Nevilly S/Seine, France
Filed Oct. 17, 1973, Ser. No. 407,387
Claims priority, application France, Oct. 20, 1972, 72.37253
Int. Cl. H01h *3/40*
U.S. Cl. 200—158 **5 Claims**



5. Switch according to claim **4**, wherein said movable strips are made from non-resilient material.

3,867,602
CONTACT CLUSTER FOR ARCING AND CURRENT CARRYING MEANS IN A CIRCUIT BREAKER
Melbourne G. Jawelak, McMurray, Pa., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Oct. 25, 1973, Ser. No. 409,598
Int. Cl. H01h *1/38*
U.S. Cl. 200—163 **3 Claims**



1. A contact cluster arrangement for a circuit interrupter having arc suppressive and continuous current carrying abilities comprising:
a. a base member having a mounting portion and a projecting contact support portion having a cylindrical external surface, with a groove formed therein,
b. a plurality of contact fingers each having a first pivotally supported end and a second movable contact engaging end, said pivotally supported ends engaging said groove formed in said projecting contact support portion of said base member at two separate points so as to provide improved current transfer therebetween,
c. a spacer means supported on said projecting contact support portion and positioned to engage said contact fingers between said pivotally supported ends and said

movable contact engaging ends to uniformally space said contact fingers about said projecting contact support portion,

d. at least one garter spring encircling said contact fingers between the point of engagement with said spacer means and said first pivotally supported end to bias said pivotally supported ends of said contact fingers into engagement with said contact support portion,

e. at least one garter spring encircling said contact fingers between the point of engagement with said spacer means and said movable contact engaging ends to bias said movable contact engaging ends into contact with a movable contact when moved therebetween, and

f. arc resistant material provide on the movable contact engaging ends of said contact fingers and said portion of said movable contact engaging said contact fingers.

3,867,603

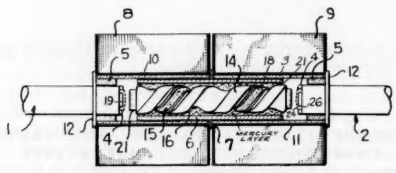
POSITION-INSENSITIVE MERCURY RELAY

Sheldon S. Bitko, Cherry Hill, N.J., assignor to Fifth Dimension Inc., Princeton, N.J.

Division of Ser. No. 302,677, Nov. 1, 1972, Pat. No. 3,786,217, which is a continuation-in-part of Ser. No. 880,128, Nov. 26, 1969, Pat. No. 3,644,693. This application Oct. 19, 1973, Ser. No. 407,899

Int. Cl. H01h *1/08*

U.S. Cl. 200—239 **2 Claims**



1. A mercury switch comprising:

a mercury wettable metallic tube,

a slug located internally of said tube,

a quantity of mercury located internally of said tube,

said slug floating in said mercury and movable longitudinally of said tube,

a mercury unwettable insulating ring terminating said tube at one end,

said slug being mercury wettable at its end nearest said one end, the total length of said slug being at least as great as the total internal length of said tube,

wherein said slug includes a central elongated core of mercury wettable material substantially surrounded by a layer of metal selected from the group tantalum and niobium, in turn surrounded by a layer of non-mercury wettable magnetic material, said layer of metal projecting axially beyond the confines of said core and said layer.

3,867,604

ELECTRIC SWITCH TOGGLE ASSEMBLY

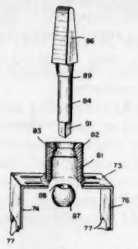
Frank J. Discenza, Rocky Hill, Conn., assignor to Carling Electric, Inc., West Hartford, Conn.

Filed Dec. 18, 1973, Ser. No. 425,727

Int. Cl. H01h *3/46*

U.S. Cl. 200—329 **6 Claims**

3. An electric switch comprising an open top case, a cover element for said case, an aperture in said cover element, a bearing seat within said aperture, a toggle element operable pivotably through said cover element, the external head of said toggle element being larger than the shaft thereof and larger than said aperture through which said shaft extends freely, and a ball collar staked upon said shaft after the latter has been projected through said aperture, said collar cooperating with said seat to perform as a pivot bearing for said toggle element.



3,867,605

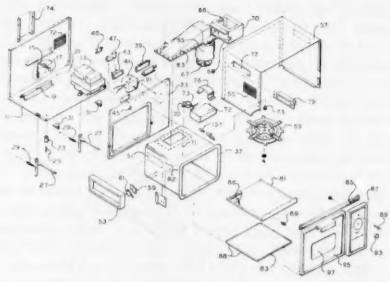
MICROWAVE OVEN

Allan Yee, Maspeth, N.Y., assignor to Welbuilt Corporation, Maspeth, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,630

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 D **14 Claims**



1. A portable microwave oven comprising:

a. a supporting frame;

b. an oven cavity attached to said frame and having an opening to insert a load;

c. means to generate microwave energy, said means including a magnetron which has a power rating approximately twice that required and means to cause said magnetron to operate at approximately half its rated power;

d. a wave guide coupling said microwave energy to said cavity;

e. a stirrer arranged to intercept and distribute the microwave energy within said cavity;

f. means to control operation of said generating means; and

g. means to seal off the opening of said cavity comprising:

1. a frame hinged to said supporting frame;

2. a backing plate securely attached to said hinged frame; and

3. a sealing plate flexibly attached to said backing plate, so that it may effect a metal-to-metal seal with said cavity.

13. A portable microwave oven comprising:

a. a supporting frame;

b. an oven cavity attached to said frame and having an opening to insert a load;

c. means to generate microwave energy, said means including a magnetron which has a power rating approximately twice that required and means to cause said magnetron to operate at approximately half its rated power;

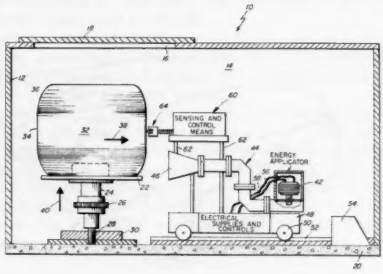
d. a wave guide coupling said microwave energy to said cavity;
e. a stirrer arranged to intercept and distribute the microwave energy within said cavity and comprising:
1. a metallic center disk having a plurality of radially projecting arms;
2. an annular metallic ring, larger than said disk, having a plurality of projections radial thereto, at least two of which are aligned with two corresponding projections on said disk; and
3. at least two non-conductive straps coupling said disk and said ring;
f. means to control operation of said generating means; and
g. means to seal off the opening of said cavity.

3,867,606

MICROWAVE HEATING APPARATUS FOR ROTATABLE ARTICLES

Robert A. Peterson, Canton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 15, 1973, Ser. No. 406,770
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 **2 Claims**



1. Microwave heating apparatus comprising:
an enclosure;
an electromagnetic energy source;
means for supporting and rotating an article having a substantially nonuniform cross-sectional contour to be heated within said enclosure;
means for radiating said article with said energy comprising waveguide feed means coupled to said source and terminating in a horn energy radiator with said waveguide and source mounted on a vehicle adapted to be moved relative to said rotating article; and
means for controlling the positioning of said radiator relative to the exterior surfaces of the rotating article comprising a freely rotatable wheel in continuous contact with said rotating article when said energy is radiated secured adjacent to the end of said radiator and means for moving said vehicle relative to said rotating article actuated by the substantially horizontal linear movement of said wheel.

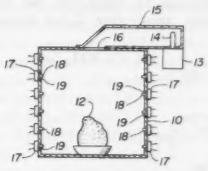
3,867,607

HYBRID MICROWAVE HEATING APPARATUS

Tetsuro Ohtani, Otsu, Japan, assignor to New Nippon Electric Co., Ltd., Shiga, Japan

Filed Dec. 3, 1973, Ser. No. 420,788
Claims priority, application Japan, Dec. 13, 1972, 47-143486
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 **6 Claims**

1. A microwave heating apparatus comprising an enclosure, a magnetron mounted on said enclosure for directing microwave energy into said enclosure, and a plurality of solid state oscillators mounted to direct microwave energy into said



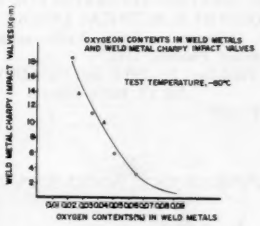
enclosure, whereby the microwave power and the distribution of temperature in said apparatus may be readily controlled.

3,867,608

SUBMERGED ARC WELDING PROCESS FOR VERY LOW-TEMPERATURE STEEL AND WELDED PRODUCT

Toshio Ohwa, Kamakura; Kosaku Taketomi; Osamu Tanaka, both of Fujisawa; Bunshiro Sakai, Fukuyama; Tadaaki Taira, Fukuyama, and Kiyoteru Hirabayashi, Fukuyama, all of Japan, assignors to Kobe Steel Ltd., and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Sept. 20, 1973, Ser. No. 399,280
Claims priority, application Japan, Sept. 29, 1972, 47-97208
Int. Cl. B23k 9/18
U.S. Cl. 219—73 **11 Claims**


OXYGEON CONTENTS IN WELD METALS AND WELD METAL CHARPY IMPACT VALVES
TEST TEMPERATURE,-60°C
WELD METAL CHARPY IMPACT VALVES(Kg/m)
OXYGEN CONTENTS(%) IN WELD METALS

1. A submerged arc welding process for welding low-temperature steel comprising submerged arc welding
A. adjoining steel pieces, said steel consisting essentially of up to 0.15% carbon, less than 0.4% silicon, between 1% and 2% manganese, at least one element selected from the group consisting of nickel in an amount of from 1% to 4%, molybdenum in an amount from 0.05% to 0.3%, and niobium in an amount of from 0.01% to 0.1%, and the balance being essentially iron, with
B. a welding electrode consisting essentially of up to 0.1% carbon, less than 0.4% silicon, between 1.4% and 2.5% manganese, between 0.2% and 0.5% titanium, between 0.006% and 0.02% boron, at least one element selected from the group consisting of nickel in an amount from 0.5% to 2.5% and molybdenum in an amount of from 0.15% to 1%, and the balance being essentially iron,
C. at least one of said steel and said electrode contains molybdenum,
D. in the presence of a flux, to form a welded steel joint consisting of said steel pieces joined by weld metal having superior impact resistance at low temperatures, said weld metal consisting essentially of up to 0.1% carbon, less than 0.40% silicon, between 1.2% and 1.7% manganese, between 0.08% and 0.5% molybdenum, between 0.02% and 0.05% titanium, between 0.0012% and 0.004% boron, up to 4% nickel, and less than 0.045% oxygen.

3,867,609

METHOD OF CONNECTING TWO PARTS

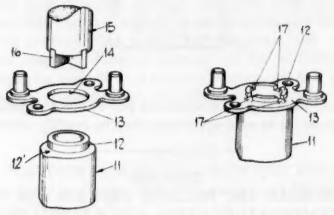
Bernard Alan Potter, Birmingham, England, assignor to The Lucas Electric Co., Ltd., Birmingham, England

Filed Jan. 31, 1974, Ser. No. 438,341

Claims priority, application Great Britain, Feb. 3, 1973, 5463/73

Int. Cl. B21j 5/08

U.S. Cl. 219—150 V 5 Claims



1. A method of connecting a sintered metal part including an integral sleeve having a shoulder thereon to another part having therein an aperture for receiving said sleeve, comprising the steps of interengaging the two parts with said sleeve extending through said aperture and said part having a portion resting on said shoulder and performing a hot riveting operation at a plurality of spaced locations on the projecting portion of said sleeve of said sintered part.

3,867,610

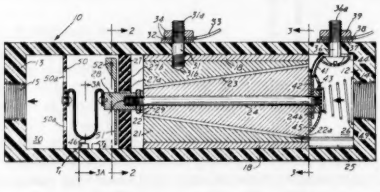
ELECTRIC HEATING APPARATUS FOR HEATING A LIQUID BY ELECTRICAL CONDUCTION

Laythol W. Quaintance, Tahoe, Calif., assignor to Harry M. Rubenstein, Phoenix, Ariz.

Filed Dec. 17, 1973, Ser. No. 425,078

Int. Cl. H05b 3/60

U.S. Cl. 219—286 3 Claims



1. Electric heating apparatus for heating electrically conductive fluids comprising:

an outer casing of an electrically non-conductive material having end portions defining a flow inlet and flow outlet, a hollow, outer female electrode, disposed within said outer casing and having a truncated cone-shaped inner surface,

and inner male electrode having a truncated cone-shaped outer surface disposed in the outer electrode spaced from and concentric with said outer electrode surface to provide an annular flow passage therebetween having a selected gap width, said outer female and inner male electrode surfaces converging from the inlet end to the outlet end to decrease the fluid-carrying volume of said passage toward the outlet end thereby preventing the fluid from boiling away as it passes through said flow passage,

power circuit means for applying an electric voltage to at least one of said outer female and inner male electrodes using the fluid in the passage as a conductor to ground potential for the current flow of each of said electrodes to ground potential through the fluid to prevent electroplating of the electrodes,

support means at both the upstream and downstream ends of the inner male electrode for supporting said inner male electrode for axially alined movement while maintaining concentric uniformity in the annular flow passage, said support means including a plurality of circumferentially spaced guides in the upstream end of the casing engaging the periphery of the inner male electrode and a downstream support in the downstream end of the casing supporting an extension of the inner male electrode, and

axial positioning means for positioning the inner male electrode at a position of minimum spacing and axially moving the male electrode inclusive of a temperature responsive member downstream of the electrodes to automatically adjust the spacing between the inner and outer electrodes in response to the temperature of the fluid to maintain a substantially uniform heating effect for the fluid.

3,867,611

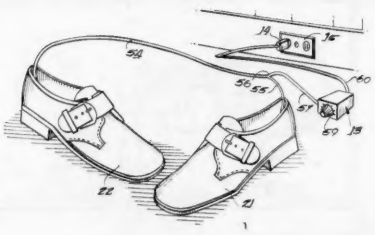
BOOT AND SHOE DRYING DEVICE

Raymond C. Riley, P.O. Box 489, 1520 Burnam Rd., Chillicothe, Mo. 64601

Filed Oct. 2, 1973, Ser. No. 402,715

Int. Cl. H05b 3/06

U.S. Cl. 219—523 3 Claims



1. A boot and shoe drying device intended for removable insertion into boots, shoes, and the like for drying the moisture out of the same, the device comprising, in combination:

a pair of separate innersole members each of a shape and configuration adapted to be inserted into a boot, shoe and the like to be dried and conformed to the insole thereof to lay in flat juxtaposition thereover in contact therewith; each innersole being formed of a substantially flat material having a generally elliptical heel portion and a generally interconnected elliptical front portion formed contiguous therewith the heel and front portions substantially conforming to the insole of a conventional shoe, boot, and the like with it being of a width and length to substantially overlie the complete width and length of the insole, the side edges of the heel and front portions each being in the form of concave arcuate curved portions;

each innersole consisting of a substantially flat base member and a substantially flat covering member of the same size and configuration as the base member;

the base member having a bottom surface defining the bottom surface of the innersole and a substantially flat top surface;

the covering member having a bottom surface disposed in juxtaposition with the base member top surface and having a top surface defining the top surface of the innersole; a substantially concentric elongated spiral groove having a semi-circular cross-section formed integrally in the base member top surface defining a spiral type configuration conforming to the side edges of the heel and front portion of the innersole with the spiral beginning at the center of the innersole and growing continuously larger until reaching the outermost edge portions of the innersole;

a concentrically spiral groove of a semi-circular cross-section formed integrally in the bottom surface of the covering member corresponding to and in registration with the groove in the base member and cooperating with the base member groove to define therebetween a passageway having a circular cross-sectional diameter;

means securing the covering member to the base member; the base member and covering member being fabricated of an electrical non-conducting insulating material;

a length of non-insulated electrical heating resistance wire having a circular diameter extending through the passageway in each of the innersoles which extend over a substantial area of each innersole, the diameter of the heating wire being substantially equal to the diameter of the passageways for frictionally securing the heating wire in position in the innersole;

the terminal pair of ends of each of the heating wires terminating adjacent the back end edge of the heel portion of each innersole;

the ends of the heating wires of each innersole being electrically joined together in electrical parallel relationship;

a thermostat for controlling the temperature of the heating wires;

suitably insulated electrical wiring interconnecting one end of the thermostat with one set of joined ends of the electrical heating wires to place the thermostat in electrical series relationship therewith;

a suitably insulated electrical wire having one end electrically connected to the opposite end of the thermostat with the opposite end adapted to be connected to a suitable source of electrical energy;

a further suitably insulated electrical wire having one end electrically joined to the opposite joined ends of the electrical heating wires with the opposite end adapted to be connected to a source of electrical energy; and

a manually operated electrical switch connected in series relationship intermediate the thermostat and the heating wires for selectively energizing and de-energizing the heating wires from the source of electrical energy.

3,867,612

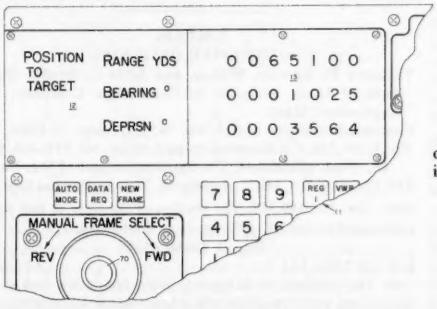
FILM VIEWER DISPLAY ENCODER

Samuel Maloof, Westwood, Mass., assignor to The United States of America as represented by the Department of the Navy, Washington, D.C.

Filed Nov. 8, 1972, Ser. No. 304,702

Int. Cl. G06k *5/00*; **G11b** *11/08*; **G06k** *7/10, 15/18*

U.S. Cl. 235—61.7 R **1 Claim**



1. A device for controlling the operation of a computer having a display panel comprising:

strip film means containing spaced segments of visual information and related digital control information;

means for simultaneously displaying said visual information to a viewer and said digital control information to the computer logic,

said means for displaying including a film viewer display encoder positioned behind said computer display panel so as to project a rear projection of said visual information thereon,

said encoder including an encoder lamp for projecting said control information, a photosensitive means for reading said visual information and means for conveying said control information to the computer logic;

a photodiode in said encoder, a fiber optic bundle having one end disposed opposite said photodiode, and a shutter interposed between the other end of said bundle of light pipes and said photodiode for selectively interrupting the light impinging on said photodiode; and

a stepper motor for driving said film means bi-directionally in increments,

said shutter driven by said stepper motor so as to interrupt the light of said photodiode in synchromium with film advance,

said control information presented in a matrix of discrete squares at least two of which are reserved one for an odd parity check and the other as a tape check,

said computer logic adapted to compare the output of said photosensitive means to said visual information and, if the two correspond, to stop said encoder and present the related computer data to the viewer in said computer display panel opposite said visual information.

3,867,613

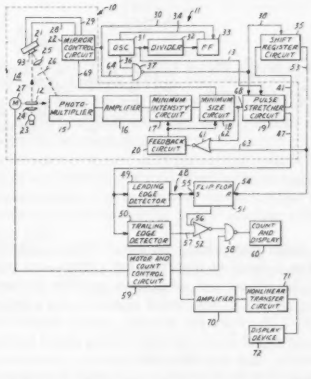
PARTICLE COUNTING APPARATUS

David J. Schoon, Saint Croix, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 1, 1972, Ser. No. 302,810

Int. Cl. G06m *11/04*

U.S. Cl. 235—92 PC **26 Claims**



1. Particle detection apparatus for determining the number of those particles having a predetermined size that are present in a plurality of particles dispersed over a field comprising:

scanning means for scanning said field using a succession of scan cycles, each of said scan cycles moving across said field for successive scanning of each particle presented to the scan cycle, said scanning means providing a particle indicating signal each time a particle having a predetermined size is scanned and supplying a synchronizing pulse at the beginning of each scan cycle;

a clock pulse generator connected to said scanning means for receiving said synchronizing pulse and supplying a selected number of clock pulses in response to said synchronizing pulse and at a rate causing the last of said clock pulses to occur prior to completion of a scan cycle;

a scan cycle memory including a shift register having a clock input, a data input and an output, said shift register requiring said selected number of clock pulses for a cycle of operation, said clock input connected to receive said

clock pulses, said data input connected to serially receive each of said particle indicating signals developed by said scanning means, said shift register entering a particle indicating signal when present at said data input while one of said clock pulses is present at said clock input and shifting said entered particle indicating signal to said output upon subsequent receipt by said clock input of clock pulses equal to said selected number; and

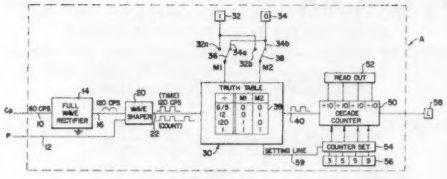
a signal coincidence circuit for presenting a count signal in response to a first signal unless a second signal is received by said signal coincidence circuit during said first signal, said signal coincidence circuit connected to said scanning means to receive said particle indicating signals from said scanning means as one of said first and second signals and connected to said output of said shift register to receive said particle indicating signals from said shift register output as the other of said first and second signals.

3,867,614

PROGRAMMABLE DIVIDER FOR COMBINED COUNTER AND TIMER

Robert R. White, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed May 9, 1972, Ser. No. 251,775
Int. Cl. H03k *21/06*
U.S. Cl. 235—92 T **5 Claims**



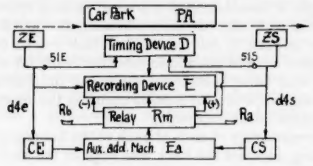
1. In a timer comprising an input circuit adapted to be connected to a clocking signal having a frequency of substantially 60 cycles per second, a full wave rectifier converting said clocking signal to a pulsing input signal having a frequency of substantially 120 cycles per second, circuit means for changing said input signal into a pulsing driving signal having a train of input pulses, said train of pulses having a preselected time base frequency, a binary counter means for counting said input pulses and including an output means for indicating when a preselected number of input pulses has been counted by said counter means, means for directing said train of input pulses to said counter means, and means for adjusting said preselected number, the improvement comprising: said frequency changing circuit means including circuit means for passing five pulses from each six pulses of said input signal whereby said pulsing driving signal has a time base frequency of 100 cycles per second, said frequency changing circuit includes a second binary counting means driven by said input signal for counting the individual pulses of said input signal from 1 to at least 5, means for creating a counting pulse by a discrete actuation in response to a pulse from said input signal, blocking means responsive to a count of 5 on said second binary counting means for blocking the discrete actuation of said pulse creating means when a sixth pulse of said input signal is applied to said counting pulse creating means and means for resetting said second binary counting means after said blocking means has been actuated.

3,867,615

APPARATUS FOR DETERMINING THE TOTAL DURATION OF TRANSITORY PHENOMENA

Amedee Sioufi, Rue de Damas, Beyrouth, Lebanon

Continuation-in-part of Ser. No. 845,188, July 28, 1969,. This application July 27, 1972, Ser. No. 275,861
Int. Cl. G08g *1/065*
U.S. Cl. 235—92 TC **3 Claims**



1. An apparatus for determining the parking time of vehicles in a car park, comprising:

a first detecting means for supplying a signal when a vehicle enters the park,

a second detecting means for supplying a signal when a vehicle departs from the park,

timing means for assigning said signals from said first and second detecting means in time and for attributing different algebraic signs to the assigned times of said signals depending upon which of said detecting means they come from,

computing means for summing the assigned times of said signals in an algebraic sum, for obtaining by the computing means information corresponding to the result of the operation $\Sigma Tsi - \Sigma Tei$, in which Tsi and Tei are, respectively, the departure times and the entry times of the vehicles in order to determine the total parking time of the vehicles in the park, said apparatus being for determining the total time spent in the car park by cars in a time interval between an initial time and a final time, wherein the park is empty at the initial time and cars can remain in the park at the final time, counter means operatively responsive to said first and second detecting means for determining the number of cars still in the park at the final time, and

a relay means for transmitting to said computing means at the final time a correction term equal to the product of said final time multiplied by the number of cars left in the park.

3,867,616

AUTOMATED DESIGNING

Theodore H. Korelitz, Waban, and Alvin C. Brodie, Dover, both of Mass., assignors to The Badger Company, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 767,891, Sept. 3, 1968, Pat. No. 3,636,328, Continuation-in-part of Ser. No. 419,466, Dec. 18, 1964, abandoned, Continuation-in-part of Ser. No. 223,324, Sept. 13, 1962, abandoned. This application Sept. 14, 1971, Ser. No. 180,318. The portion of the term of this patent subsequent to Jan. 18, 1989 has been disclaimed.
Int. Cl. G06b *15/46*
U.S. Cl. 235—151.1 **11 Claims**

1. The method of designing, interconnecting and visibly illustrating a system of linearly interconnected operating units into a composite operating system, comprising forming a plot plan consisting of a graphical diagrammatic arrangement of each of said operating units with each unit of said system graphically positioned therein in scale dimensions and arranged in three-dimensional space in design position before each unit is interconnected into the system,

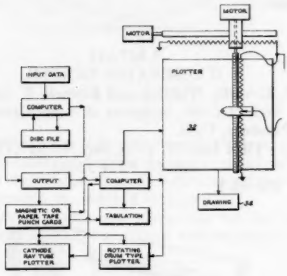
forming a table of dimensions significant of each unit and the points thereon to be linearly interconnected measured by the designer from any point in the plot plan

common to said units in symbols recognizable by a draftsman,

programming a computer to convert the said designer's measurement data of said table to coded form acceptable to a computer and orienting said data to the graphical origin of said plot plan,

feeding the computer with said coded data,

executing programmed steps to impose constraining limits upon said computer to compute and store data representative of said points in the memory of said computer,



executing programmed steps to mathematically define a path interconnecting said units to be interconnected within said constraining limits,

whereby each line thus defined becomes a limiting exclusion upon the next succeeding lines,

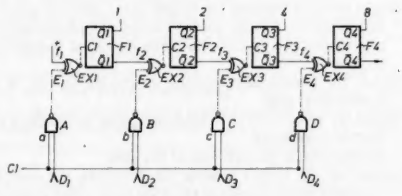
and finally converting all of the data in the memory of said computer to visible form comprising a system of said units linearly interconnected through said points.

3,867,617

CONVERSION UNIT FOR ELECTRICAL SIGNAL SEQUENCES

Carl Ib Peder Larsen, Slagelse, Denmark, assignor to Haldex Aktiebolag, Halmstad, Sweden

Filed Mar. 22, 1973, Ser. No. 343,966
Claims priority, application Sweden, Apr. 5, 1972, 4383/72
Int. Cl. G06f *7/50;* **G07b** *13/00*
U.S. Cl. 235—151.32 **7 Claims**



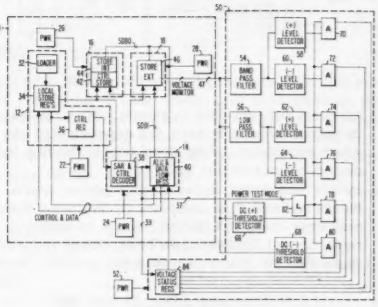
1. A conversion device comprising: programmable counting means receptive of a plurality of programming signals during use corresponding to a preselected pulse weighting function and having an input responsive to a sequential pulse train applied thereto during use for developing only successive predetermined sets of output signals wherein each set corresponds to the binary representation of an integral multiple of said preselected pulse weighting function; and means for programming said programmable counting means to effect a desired pulse weighting function, said programmable counting means comprising a first plurality of counting stages each including a flip-flop having a clock input and an inverting output and a non-inverting output from which one of said output signals of said set of output signals is taken, an Exclusive-Or gate having two inputs and one output connected to the clock input and a Nand gate having one input receptive of one of said programming signals and another input receptive of the sequential pulse train signal and having an output connected to one input of said Exclusive-Or gate, and wherein the other input of the Exclusive-Or gate in each stage after the first is connected to the inverting output of the flip-flop of the preceding stage.

3,867,618

DYNAMIC POWER SUPPLY TEST SYSTEM

Burton L. Oliver, Endicott, and Wayne R. Sitler, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 25, 1973, Ser. No. 373,539
Int. Cl. G06f *11/00*
U.S. Cl. 235—153 AC **5 Claims**



1. Apparatus for testing power supply means in a data processing system, comprising:

a data processing system having a plurality of functional units, each said functional unit having one or more independent power supply means;

means for operating said data processing system to exercise each of said plurality of functional units to cause a predetermined series of active power supply loading conditions followed by inactive power supply loading conditions to occur; and

means connected to said data processing system and responsive to said active and inactive power supply loading conditions for determining the occurrence and location of faults.

3,867,619

DESK TOP ELECTRONIC COMPUTER WITH DIGITAL CLOCK

Keijiro Arauchi, Tokyo, Japan, assignor to Tobishi Pharmaceutical Co., Ltd.

Filed June 5, 1973, Ser. No. 367,289
Claims priority, application Japan, June 24, 1972, 47-63537
Int. Cl. G06f *7/48;* **G04b** *47/00*
U.S. Cl. 235—156 **2 Claims**

1. A desk top type electronic computer with a digital clock, comprising:

power source circuit means;

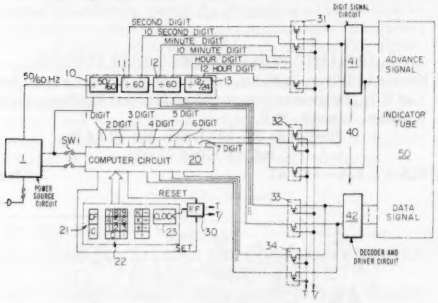
frequency divider circuit means of a digital clock, said frequency divider circuit means being connected at all times at its input to said power source circuit means and providing digit and data signal outputs;

a desk computer circuit means for providing digit and data signal outputs and setting and resetting signal outputs;

an indicating circuit means and an indicator tube controlled thereby for use in common by the computer and the clock;

a plurality of switching devices for selectively connecting the digit and data signal outputs from said frequency divider circuit means and the digit and data signal outputs from said desk computer circuit means to said indicating circuit meanns;

a flip-flop connected in controlling relationship to said switching devices and in controlled relationship to said desk computer circuit means;



a keyboard for said desk computer circuit, said keyboard including calculating keys, the depression of any one of which provides a setting signal to said flip-flop from said desk computer circuit; and

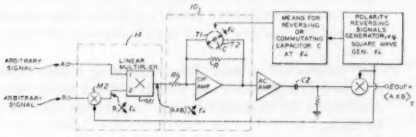
a switch connected between said power source circuit means and said desk computer circuit means for causing said desk computer circuit means to supply a setting signal to said flip-flop upon being closed and a resetting signal thereto upon being opened.

3,867,620

SIGNAL CORRELATOR WITH IMPROVED DYNAMIC RANGE

Thomas Coor, Princeton, N.J., assignor to Princeton Applied Research Corporation, Princeton, N.J.

Filed Jan. 26, 1973, Ser. No. 327,145
Int. Cl. G06g *7/19, 7/16*
U.S. Cl. 235—181 **61 Claims**


ARBITRARY SIGNAL
ARBITRARY SIGNAL
LINEAR MULTIPLIER
MEANS FOR REVERSING OR COMMUTATING CAPACITOR C AT F_R
POLARITY REVERSING SIGNALS GENERATOR, SQUARE WAVE GEN. F_R
FOUT

29. Signal correlator apparatus with improved dynamic range for providing an indication of the time average of the product of two arbitrary signals, which apparatus utilizes an electronic multiplier whose output signal will include DC drift and offset due to circuit imperfections in said multiplier, comprising:

additional multiplier means for multiplying one of said signals with a predetermined polarity reversing signal to provide said one signal repetitively reversed in polarity in accordance with the sign of said predetermined polarity reversing signal,

said electronic multiplier for multiplying said one signal repetitively reversed in polarity times the other of said signals to provide the product of said signals in the form of a predetermined product signal repetitively polarity reversed in accordance with the sign of said predetermined polarity reversing signal, the output signal from said electronic multiplier comprised of said predetermined product signal and said DC drift and offset and wherein the peak-to-peak amplitude of said predetermined product signal is proportional substantially only to the actual product of said signals and is substantially independent of said DC drift and offset;

synchronous filter means for filtering said output signal of said electronic multiplier in synchronism with said predetermined polarity reversing signal to attenuate said DC drift and offset thereby to provide an AC output signal; and

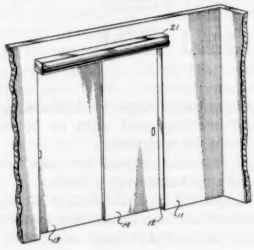
means for synchronously rectifying said AC output signal in synchronism with said predetermined polarity reversing signal to provide a DC signal which is said indication of the time average of the product of said two arbitrary signals.

3,867,621

ILLUMINATED HEADER

Harry R. Gewfrtz, Whittier, and Kenneth K. Kellems, Costa Mesa, both of Calif., assignors to Acme General Corporation, Pasadena, Calif.

Filed Jan. 29, 1973, Ser. No. 327,729
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 R **3 Claims**



1. A closet illuminator for mounting along the top of a door frame having a movable door comprising:

an elongated strip having a substantially uniform transverse cross section and a sufficient length for spanning a closet doorway;

three insulated electrical conductors extending the length of the strip;

means for connecting the strip along the top of a door frame on the exterior of a closet;

detent means extending the length of the strip for receiving and retaining a lamp socket having complementary detent means in a position to make electrical contact with the conductors;

means for continually applying electricity to two of the conductors; and

means for selectively switching electricity to the third conductor comprising:

a switch module at each end of the strip;

means on the switch module for actuating the switch in response to movement of the door from a first position to a second position; and detent means complementary to the detent means on the strip for retaining the switch in position.

3,867,622

REVOLVING LIGHTED PAGE MAKEUP FOR GRAPHIC ARTS

Harry E. Billman, Montoursville, Pa., assignor to Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,633
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 P **2 Claims**

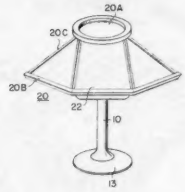
1. A makeup table comprising:

a vertical shaft;

an inclined light source;

means supporting said source and secured to the shaft; and

a hollow casing having a flat circular top and rotatably disposed about the shaft and source, said casing having a plurality of inclined light transparent faces having the same inclination as the source, each face having an opening covered by a plate of transparent glass, said casing being rotatable to selectively index any of said faces in front of the source whereby light emitted therefrom extends through the indexed face; and



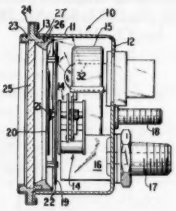
a horizontal disc disposed above the top and separately rotatable about an axis aligned with the shaft.

3,867,623

AUTOMOTIVE GAUGE FLOOD-LIGHTED DIAL

Charles R. Widlund, Schwenksville, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,392
Int. Cl. G01d *11/28*
U.S. Cl. 240—2.1 **5 Claims**



1. In an indicator instrument, the combination of a casing, a dial face within said casing and having its peripheral edge spaced from the casing wall, a light source mounted within said casing behind said dial face, and light reflecting ring means positioned between the front of the casing and the dial face, said ring means comprising a light reflecting surface facing the light source and a surface portion thereof extending annularly beyond said dial face at a predetermined distance therefrom for receiving light from said light source around and between the casing and dial face edge and for reflecting said light across the entire dial face to illuminate the same, the light reflecting ring means having spacer means for engaging the dial face peripheral edge for maintaining the dial face predetermined distance therefrom.

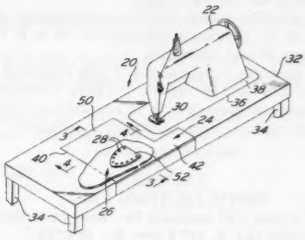
3,867,624

FLUSHED MOUNTED LIGHTED TABLE FOR USE WITH SEWING MACHINES

Thomas Joella, Delaboe, Bangor, Pa. 18013, and Robert Z. Mickus, R.D. 2, New Tripoli, Pa. 18066

Filed Dec. 6, 1973, Ser. No. 422,448
Int. Cl. D05b *79/00*
U.S. Cl. 240—2.14 **8 Claims**

1. A table having a top and a bottom surface and supporting a sewing machine thereon, said sewing machine including a needle, said table including illumination means comprising a surface for directing supporting a workpiece to be sewn by said machine and for illuminating from below indicia apertures in the workpiece when the workpiece is placed upon said workpiece supporting surface to facilitate the sewing of said workpiece, said workpiece supporting surface being flush with the top surface of said table and extending in front of and to the side of the needle of the sewing machine, said illumination means comprising a base, fluorescent light emitting means disposed over said base and a light transmitting cover disposed over said light emitting means, said base being flush with the bottom surface of said table, said cover forming the workpiece supporting surface of said table.

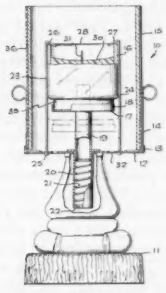


3,867,625

CANDLE LAMP

Charles C. Whalen, 941 X. Osage Ave., #301 Inglewood, Calif. 90301

Filed July 16, 1973, Ser. No. 379,717
Int. Cl. F21v *35/00*
U.S. Cl. 240—13 **1 Claim**



1. In a table lamp having a glass container holding candle wax and a wick, the combination comprising:

a hollow stand;

a base having a peripheral upstanding edge and fixed to said stand;

a cylindrical shade carried on said base adjacent to and confined by said peripheral upstanding edge thereof;

means movably carried on said base for supporting said glass container;

resilient means axially biasing said movable means away from said base;

hook means secured to said base and engagable with said glass container to arrest movement of said movable means;

said cylindrical shade being of flexible material co-axially disposed about said glass container and supported on said base;

resilient clips carried on said base yieldably engagable with said shade for retaining said shade on said base;

said movable means includes a carrier plate and a downwardly extending sleeve engageable with one end of said resilient means;

said base includes a tube downwardly extending therefrom into said hollow stand slidably receiving said sleeve and for housing said resilient means;

said base is circular and includes a continuous sidewall formed on the peripheral edge thereof so as to encircle the bottom of said shade; and

said hook members include a pair of rods separated by said glass container and having one end fixed to said base and its opposite end formed with an integral hook releasably engagable with the edge of said glass container.

3,867,626

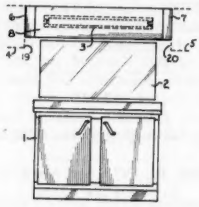
SOFFIT LIGHTING UNIT

Bertram A. Wilson, 507 Seminole Dr., Erie, Pa. 16505

Filed Oct. 5, 1973, Ser. No. 403,785

Int. Cl. F21s *1/02*

U.S. Cl. 240—73 R **10 Claims**



1. An adjsutable soffit lighting unit housing for a lighting fixture which has been previously mounted adjacent a wall comprising laterally spaced right and left generally rectangular end caps each with an end wall and front, back, top and bottom peripheral size flanges outstanding from corresponding edges of the end wall, means for mounting each cap by one of its flanges with the end walls of the caps outstanding from said wall and the flanges of said caps spaced from and extending toward each other, and panel means cooperating with said caps for blocking direct view of the light source from said lighting fixture and providing illumination below said light source, said panel means bridging the space between said caps and having ends extending within and concealed and supported by said caps throughout a range of widths of spacing of the caps so the caps may be positioned toward and away from each other in any desired fraction from 0 to 100 percent of said range while still supporting said panel means and said panel means may be made in standard lengths and be installed to give the appearance of a custom fit.

3,867,627

FAST DATA ACQUISITION SYSTEM

Melvin A. Nelson; Terence J. Davies, Santa Barbara, and John C. Clark, Pleasanton, all of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 8, 1974, Ser. No. 431,809

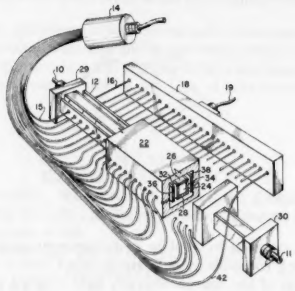
Int. Cl. H04b *9/00*

U.S. Cl. 250—199 **10 Claims**

1. A high speed data aquisition system comprising:

a. a longitudinally extending electro-optical modulator having means for transmitting an electrical signal to be recorded as a traveling wave longitudinally therewithin,

b. means for transmitting a plurality of optical pulses to a plurality of locations along one side of said longitudinally extending modulator, and



c. light detector means positioned on the opposite side of said modulator in alignment with said locations for receiving light transmitted through said modulator.

3,867,628

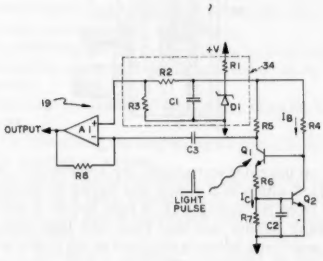
PULSED LIGHT RECEIVER AND METHOD

Roger M. Brown, Mountain View, Calif., assignor to Scientific Technology Incorporated, Mountain View, Calif.

Filed July 30, 1973, Ser. No. 383,786

Int. Cl. H01j *39/12*

U.S. Cl. 250—206 **23 Claims**



1. A receiver comprising means for producing an electrical output responsive to electromagnetic radiation input,

an electrical control input terminal connected to said means producing electrical output,

means connected to said electrical control input terminal for controlling said electrical output at a constant level in the absence of electromagnetic radiation input so that said means responsive to electromagnetic radiation is operated at optimum sensitivity,

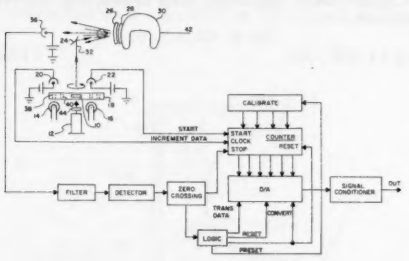
means for attenuating electrical output due to ambient electromagnetic radiation pulse frequency components below a predetermined pulse frequency component connected to said electrical control input terminal, and

means for providing a low load impedance for said electrical output above said predetermined pulse frequency component so that the fastest response time of said means responsive to electromagnetic radiation may be utilized.

3,867,629
SYSTEM FOR MEASURING ROTATION USING POLARIZED LIGHT

Lyman F. Van Buskirk, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,969
Int. Cl. G02f *1/18*
U.S. Cl. 250—225 **9 Claims**



1. A system for measuring the rotational orientation of an object by comparing its orientation with a known reference, comprising:

an object;

a reflector backed polarizer attached to said object for rotation therewith;

a source of linearly polarized light illuminating said polarizer wherein the polarization of said light rotationally varies at a constant rate, including an illumination source a rotatable quarter wave-plate in the path of said light and means for rotating said quarter wave-plate;

means for measuring the rotational orientation of said polarized light;

means for directing said polarized light onto said reflector backed polarizer; and

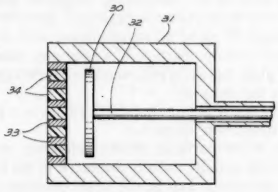
means for detecting the polarized light reflected by said reflector backed polarizer;

wherein the polarized light is reflected and detected by said detecting means when the rotational orientation of the linearly polarized light matches the rotational orientation of the object.

3,867,630
SENSOR FOR SUBMERSIBLE PROBES

Horst Urban, Nordenham, Germany, assignor to Norddeutsche Seekabelwerke Aktiengesellschaft, Nordenham, Germany

Filed July 20, 1972, Ser. No. 273,511
Claims priority, application Germany, Jan. 26, 1972, 2203475
Int. Cl. G01n *21/22*; **G02b** *5/00*
U.S. Cl. 250—239 **6 Claims**

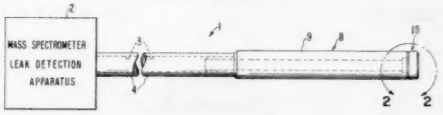


1. In a sensor for submersible probes to be used in a fouling environment, a combination comprising a sealed housing having a window portion and defining an enclosed space; and a sensor accommodated in said space and facing said window portion, said window portion having a surface exposable to said fouling environment, and being composed of alternating lamellae of light-transmissive substance for admitting light from said environment into said space, and of anti-fouling copper alloy for preventing fouling of said light transmissive lamellae, said copper alloy lamellae having a combined exposed surface area amounting to substantially 90 percent of said exposable surface of said window portion.

3,867,631
LEAK DETECTION APPARATUS AND INLET INTERFACE

Walton E. Briggs, Lynnfield, and Joseph C. Maliakal, Millis, both of Mass., assignors to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 293,206, Sept. 28, 1972, Pat. No. 3,828,527. This application Feb. 14, 1974, Ser. No. 442,544
Int. Cl. H01j *39/34*
U.S. Cl. 250—281 **7 Claims**

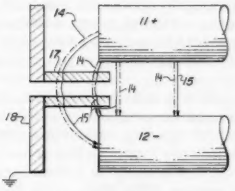


1. A vacuum leak detection system for detecting the presence of a leak-indicative helium gas signal in an atmosphere, said system comprising a mass spectrometer capable of detecting helium gas, means forming a gas inlet passage to said mass spectrometer, membrane means capable of admitting helium gas therethrough preferentially with respect to other gases in the atmosphere, said membrane means comprising a solid one-piece polytetrafluoroethylene membrane sealed across said inlet passage to form an interface between said inlet passage and the atmosphere.

3,867,632
METHODS AND APPARATUS FOR SPATIAL SEPARATION OF AC AND DC ELECTRICAL FIELDS WITH APPLICATION TO FRINGE FIELDS IN QUADRUPOLE MASS FILTERS

Wade L. Fite, Pittsburgh, Pa., assignor to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Filed Mar. 30, 1973, Ser. No. 346,250
Int. Cl. H01j *39/34*
U.S. Cl. 250—292 **19 Claims**



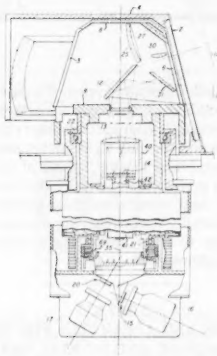
1. In a method of mass analysis which utilizes a quadrupole mass filter which comprises the steps of producing ions, causing the introduction of said ions into the space between the poles of the quadrupole mass filter, and causing the transmission of only those ions of a selected mass-to-charge ratio through the space between said poles, the improvement comprising the use of a field separation means adjacent at least one of the end of said poles composed of a material which functions substantially as a high dielectric to ac electric fields and substantially as a conductor to substantially dc electric fields emanating from said pole, said separation means configured to allow said transmission of ions and to shield them

during said transmission at least in part from the substantially dc electric fields.

3,867,633
WIDE ANGLE VIEWING SYSTEM FOR LIMITED VISIBILITY CONDITIONS

Thomas R. Patrick, Austin, and Joe H. Keahey, Lewisville, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 209,221, Dec. 17, 1971, abandoned. This application May 15, 1973, Ser. No. 360,481
Int. Cl. G01t 1/16
U.S. Cl. 250—334 **11 Claims**



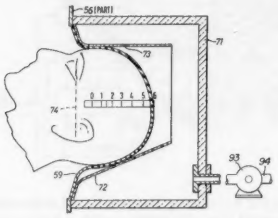
1. An apparatus for detecting radiant energy from a scene and displaying an image thereof comprising:

a. a first housing rigidly attached to a support member, said housing having a radiant energy admitting window for admitting radiant energy from a field of view of a scene;
b. a second housing rotatably mounted in said first housing;
c. an optical system, a radiant energy detector means, and a transducer means mounted for synchronous rotation with said second housing, said optical system including means for selectively forming a first optical path from the window of the first housing for radiant energy emanating from a first portion of the scene of the field of view and a second optical path from the window of the first housing for radiant energy emanating from a second portion of the scene of the field of view, said radiant energy detector means positioned to receive radiant energy from the optical system and produce electrical representations thereof, and said transducer means operatively responsive to the electrical representations of the radiant energy detector means for producing a wide angle image of the field of view of the scene;
d. a means for rotating the second housing for scanning the field of view of the scene; and
e. a display means for displaying the image of the field of view of the scene.

3,867,634
BODY PORTION SUPPORT FOR USE WITH PENETRATING RADIATION EXAMINATION APPARATUS

Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Hayes, Middlesex, England

Continuation-in-part of Ser. No. 212,778, Dec. 27, 1971, which is a continuation of Ser. No. 861,538, Aug. 21, 1969, abandoned. This application Apr. 9, 1973, Ser. No. 349,242
Claims priority, application Great Britain, Aug. 23, 1968, 40317/68
Int. Cl. G01n 23/00
U.S. Cl. 250—360 **6 Claims**



1. Apparatus for examining part of a body by means of penetrating radiation, such as X- or γ-radiation, comprising a source of said radiation, support means, transmissive of said radiation, disposed to support said body part in a predetermined position relative to said source, detector means disposed to receive radiation emergent from said body part, and a scanning structure for causing said source and detector means to execute rotational scanning motions relative to the body part, wherein said support means includes a reservoir for a liquid medium, the wall of said reservoir facing in the direction of the axis of the rotational scanning motion being formed of pouched, flexible material so that the body part to be examined, when inserted into the pouched wall, can be surrounded by the liquid medium in the reservoir, while exposed to said radiation, and means for varying the amount of said liquid medium in said reservoir to expel air from the pouch when the body part is inserted therein.

3,867,635
ACHROMATIC MAGNETIC BEAM DEFLECTION SYSTEM

Karl L. Brown, Menlo Park, and William G. Turnbull, Cupertino, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 325,296, Jan. 22, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 456,503
Int. Cl. H01j 37/00
U.S. Cl. 250—396 **27 Claims**

1. In a method for achromatic magnetic deflection of a beam of non-monoenergetic charged particles through a bending angle Ψ along a central orbital axis defined by the trajectory of a charge particle of a reference momentum P_0 is a bending plane between transverse beam entrance and beam exit planes the steps of:

subjecting the beam of charged particles to a series of magnetic deflection forces for;

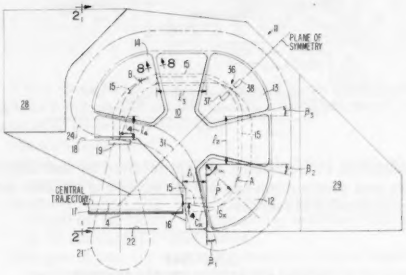
focusing beam particles of the reference momentum P_0 which are initially radially displaced in the bending plane from the orbital axis at the beam entrance plane to first and second crossovers of the central orbital axis and also to trajectories with approximately zero slope relative to the orbital axis at a region along the orbital axis intermediate the beam entrance and beam exit planes;

focusing beam particles of the reference momentum P_0 having trajectories which are on and angularly divergent from the orbital axis in the beam bending plane at the

beam entrance plane to a crossover of the orbital axis at a region along the orbital axis intermediate the beam entrance and beam exit planes;

focusing beam particles of the reference momentum P_o which are initially displaced from and parallel to the orbital axis in the transverse plane at the beam entrance plane to a crossover of the central orbital axis at a region along the orbital axis intermediate the beam entrance and beam exit planes;

focusing beam particles of the reference momentum P_o which have initial trajectories on and angularly divergent



from the orbital axis in the transverse plane at the beam entrance plane to a crossover of the orbital axis at the beam exit plane and to trajectories having zero slope relative to the orbital axis at a region along the orbital axis intermediate the beam entrance and beam exit planes; and

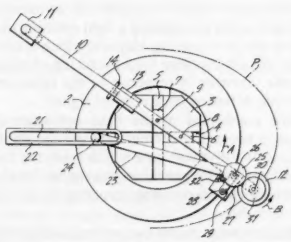
achromatically focusing beam particles of a momentum differing from the reference momentum P_o and having a trajectory initially coincident with the orbital axis at the beam entrance plane to the orbital axis at the beam exit plane.

3,867,636

APPARATUS FOR TAKING A CONTINUOUS X-RAY PICTURE OF THE DENTAL ARCH

Masato Miyahara, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Continuation of Ser. No. 327,656, Jan. 29, 1973, abandoned, and a continuation-in-part of Ser. No. 303,124, Nov. 1, 1972,.
This application Mar. 15, 1974, Ser. No. 451,507
Claims priority, application Japan, May 29, 1972, 47-53166
Int. Cl. G03b *41/16*
U.S. Cl. 250—445 **10 Claims**



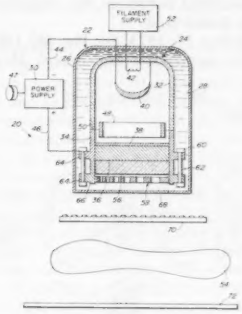
1. In apparatus for recording a continuous X-ray picture of the dental arch, a fixed base, a drive member which is mounted to rotate opposite the base, and which is equipped with an X-ray source and an X-ray film holder on opposite sides of the rotational axis thereof, means operable to rotate the drive member, means operable during the rotation of the drive member to cause the rotational axis of the drive member to shift in relation to the base such that the source and the holder trace coaxial elliptical arcs, a fixed reference, and a pair of pivotally interconnected links, a first of which is pivotally connected with the drive member, and the second of which is cam connected with the reference, said film holder being rotatably mounted on the drive member, and there being a cam fixed on one of the links, and means on the drive member yieldably biasing the cam into engagement with the film holder so that on rotation of the drive member, the film holder is caused to rotate in relation to the X-ray source.

3,867,637

EXTENDED MONOCHROMATIC X-RAY SOURCE

Martin Braun; Howard D. Doolittle, both of Stamford, Conn.; Harrison H. Barrett, Lexington, Mass.; Jay P. Sage, Newton Centre, Mass., and David T. Wilson, Billerica, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 4, 1973, Ser. No. 393,772
Int. Cl. H01j *35/16*
U.S. Cl. 250—503 **15 Claims**



1. A X-ray system comprising:

means for generating X-rays;

means for improving the monochromaticity of said X-rays, said improving means comprising a mask assembly having a first and a second mask, each of said masks having regions relatively opaque to X-radiation interspersed among regions relatively transparent to X-radiation, said second mask being spaced apart from said mask along an axis normal to a surface of said first mask, the opaque regions in one of said masks being in registration with the transparent regions of the other of said masks; and

means for spatially modulating said X-rays, said modulating means comprising regions of relative opacity to X-rays interspersed among regions having relative transparency to said X-rays, the spaces occupied by successive ones of a plurality of said opaque and said transparent regions being arranged in a monotonically decreasing order in a predetermined direction.

3,867,638

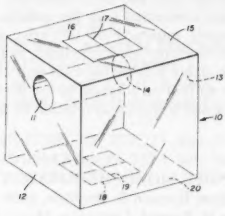
RADIATION BEAM CONSTANCY CHECK BLOCK

Robert Golden, Youngstown, Ohio

Filed Nov. 13, 1972, Ser. No. 306,357
Int. Cl. G01t *1/16*
U.S. Cl. 250—505 **4 Claims**

1. The combination of an X-ray beam constancy check block and an ionization test chamber, said block comprising a unitary body formed from a single piece of synthetic resin and having a known radiation transparency, said body having at least two parallel spaced surfaces and a third surface perpendicular thereto, said body being provided with a tubular cavity extending inwardly from said perpendicular surface and parallel with said parallel surfaces for removably receiving

said ionization test chamber, said tubular cavity being unequally distant from said spaced parallel surfaces of said body,



target indicia on said spaced parallel surfaces on a common center line extending through said tubular cavity.

3,867,639

OPTICAL CORRELATOR

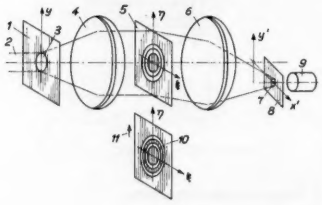
Andreas Hermann Engel, Baltimore, Md., assignor to Turlabor AG, Zumikon, Switzerland

Filed May 17, 1973, Ser. No. 361,156

Claims priority, application Switzerland, May 19, 1972, 7526/72

Int. Cl. G01n *21/30*

U.S. Cl. 250—550 **6 Claims**



1. In an optical correlator having means for producing a beam of coherent light, a test sample positioned in the path of said light beam, a hologram filter including a diffraction image of a standard object to receive a diffraction image of said test sample, light-measuring means for receiving light from said hologram filter and adapted to produce an output signal proportionate to the intensity of the light received, and diaphragm means including an aperture interposed between said hologram filter and said light-measuring means, the light from said hologram filter passing through said aperture in said diaphragm means, the improvement comprising: auxiliary filter means positioned in the path of said light beam proximate said hologram filter, said auxiliary filter means having in one half of the first, second, third et seq. diffraction order of said standard object the transmittance +1 and in the other half of said diffraction orders a transmission 0 for providing a black-white filter.

3,867,640

DUST SAMPLING SYSTEM

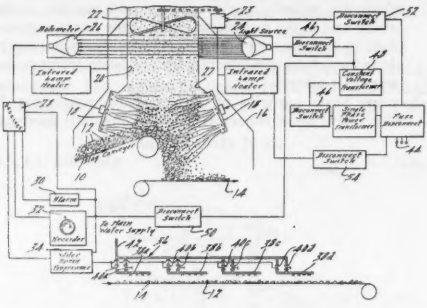
Lewis A. Paulsen, Belleville, Mich., assignor to Edward C. Levy Company, Detroit. Mich.

Filed Mar. 9, 1972, Ser. No. 233,190

Int. Cl. G01n *21/30*

U.S. Cl. 250—573 **8 Claims**

1. A dust sampling system for monitoring the dust content of moist gases including an open conduit having a gas inlet and outlet, a radiant heat source associated with said inlet and operable to vaporize moisture particles suspended in moving gases entering said inlet, a constant intensity light source directing a beam of light across said conduit downstream from said heat source, a light sensor arranged to receive light from said source and means controlled by said sensor responsive to



a reduction in the amount of light received by said detector from said source resulting from an increase in the dust particles suspended in said gases.

3,867,641

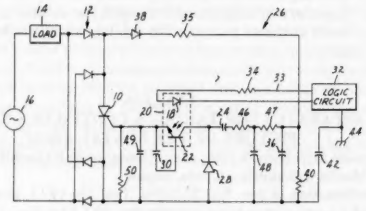
AC LOAD ACTUATION CIRCUIT

John E. Collins, North Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1974, Ser. No. 442,192

Int. Cl. H03k *17/16*

U.S. Cl. 307—117 **10 Claims**



1. An AC load actuation circuit comprising a thyristor load switching element for switching a load into connection with an AC source and a photon coupler for triggering the thyristor load switching element,

wherein the improvement comprises in combination;

said photon coupler comprising a light emitting element and a photosensitive triggering element which is connected to the gate of said thyristor load switching element for triggering the thyristor in response to the light emitting element being actuated by a control signal;

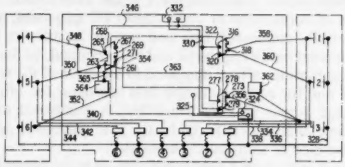
a capacitor connected in the load actuation circuit for providing a triggering current through the photosensitive element to the thyristor gate which leads the load voltage in phase to thereby provide a maximum level triggering current near the zero voltage crossing point for the load; and

a zener diode connected to the photosensitive element and to the capacitor for limiting the level of the voltage across the photosensitive triggering element due to current flow from the capacitor when power is first applied to the load actuation circuit thereby to protect the photosensitive triggering element and also thereby to enable triggering of the thyristor only in response to the gating of the photosensitive triggering element due to the actuation of the light emitting element.

3,867,642
MULTIPLE-SWITCH CLOCK

Mamut Ajrlahi, 7308 Parkwood Ct., Falls Church, Va.

Filed Feb. 15, 1973, Ser. No. 332,662
Int. Cl. H01h *43/00*; **G04c** *23/12*
U.S. Cl. 307—141 **20 Claims**



1. In a clock having a motor, a second hand, a minute hand, an hour hand, an alarm hand, and a source of electrical power associated therewith comprising:

one electrical outlet;

circuit means for connecting said electrical outlet to said source of electrical power;

normally closed first switch means disposed within said circuit for permitting and preventing said electrical power to be conducted to said outlet;

first gear means for manually setting said alarm hand to a particular time of the day at which said first switch means will be opened and electrical power to said outlet will be terminated;

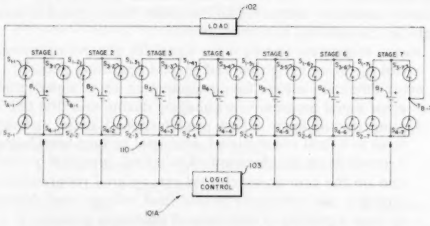
first actuating means controlled by said motor for automatically actuating said first switch means at said particular time whereby said electrical power to said outlet is automatically terminated; and

second actuating means controlled by said motor for automatically actuating said first switch means at a predetermined time subsequent to said particular time whereby said first switch means is reclosed and electrical power to said outlet is automatically resupplied.

3,867,643
ELECTRIC POWER CONVERTER

Richard H. Baker, Bedford, and Lawrence H. Bannister, Dedham, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 14, 1974, Ser. No. 432,939
Int. Cl. H02m *7/00*
U.S. Cl. 307—151 **27 Claims**

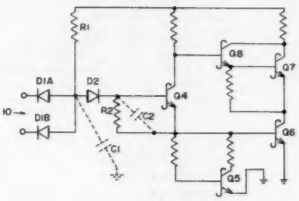


1. An electric power system comprising a plurality of stages connected in cascade, each stage including, in combination: supply voltage means; first bilateral solid-state switch means connected between the supply voltage means and one terminal of the stage; and second bilateral solid-state switch means connected between the supply voltage means and another terminal of the stage, one terminal acting as input to the stage at one state of operation of the stage and the other terminal operating as output during said one state, the roles of the two terminals being reversed at another state of operation of the stage, the first switch means and the second switch means acting in combination to connect one side or the other of the supply voltage means to either terminal as alternate conditions of stage operation or to bypass the supply voltge means.

3,867,644
HIGH SPEED LOW POWER SCHOTTKY INTEGRATED LOGIC GATE CIRCUIT WITH CURRENT BOOST

Ronald L. Cline, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jan. 7, 1974, Ser. No. 431,043
Int. Cl. H03k *19/08, 19/36*
U.S. Cl. 307—213 **3 Claims**



1. In a high speed low power Schottky integrated logic gate circuit having between input and common a $2V_{be}$ transistor voltage drop produced by first and second cascaded Schottky transistors and an opposite diode voltage drop produced by diode means coupled to said input, said voltage drops determining the threshold input voltage level, V_{TH}, at which switching occurs, an increase in ambient temperature tending to reduce said voltage drops and to reduce said V_{TH} whereby said circuit is more susceptible to noise the improvement comprising: a third transistor coupled to said first transistor in a sense to add to said V_{be} of said first transistor to raise said V_{TH}, said third transistor having its control terminal coupled to said diode means; pull out resistor means connected to said first transistor for pulling out said first transistor, current boost transistor means connected between said third transistor and a d.c. voltage source for providing a low impedance high current path for charging associated parasitic capacitances.

3,867,645
CIRCUIT FOR AMPLIFYING CHARGE

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,555
Claims priority, application Great Britain, Sept. 25, 1972, 44293/72
Int. Cl. G11c *11/24, 11/40, 19/00*; **H01l** *19/00*
U.S. Cl. 307—221 D **11 Claims**

1. The combination comprising:

a charge transfer register having a plurality of stages, said register adapted to receive a charge signal and including means for transferring said signal from stage-to-stage along said register;

a multiplicity of amplifying means spaced along said register; each amplifying means having an input coupled to a different one of said stages of said register for sensing said charge signal and having an output point for producing thereat an output signal in response to said charge signal; a common output point; and

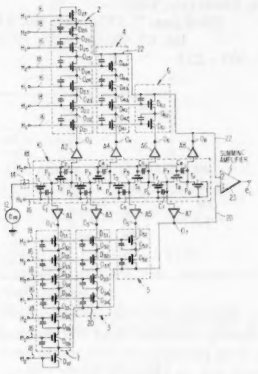
means for summing the charge signals produced at the output points of said amplifying means, including charge transfer means coupled between said output points of said amplifying means and said common output point.

9. The combination as claimed in claim **1** wherein said summing means includes two conductors;

wherein said charge transfer means of said summing means includes charge transfer registers connected between the output points of selected ones of every other one of said amplifying means and one of said two conductors and charge transfer registers connected between the output

points of selected ones of the remaining amplifying means and the other one of said two conductors;

wherein said charge transfer registers of said summing means are of varying lengths to provide different delays between the selected output points and their respective



conductors for bringing the output signals produced at said output points into time coincidence at their respective conductors; and

a summing amplifier coupled between said two conductors and said common point for combining the output signals of said two conductors at said common output point.

3,867,646

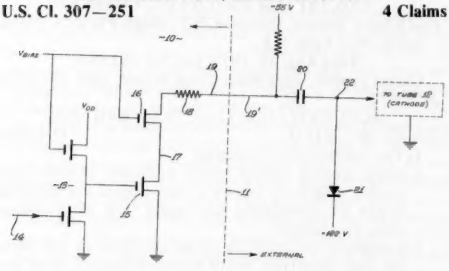
MOSFET CIRCUITRY FOR INTEGRATED CHIPS INTERFACING WITH HIGHER VOLTAGE DEVICES

Michael R. McCoy, San Jose, Calif., assignor to Electronic Arrays, Inc., Mountain View, Calif.

Filed Oct. 5, 1973, Ser. No. 403,961

Int. Cl. H05b *41/00*; **H03k** *17/60*, *19/08*

U.S. Cl. 307—251 **4 Claims**



1. In an integrated circuit chip of the MOSFET variety having an output terminal to be controlled as to effective voltage potential, and to which is applied a biasing voltage having value relative to ground in excess of the MOSFET breakdown voltage the improvement of:

an output circuit in the MOSFET chip as connected between said terminal and ground in the chip, and having

a first FET-transistor having its gate controlled from internal circuitry in the chip between conduction and non-conduction, the output circuit further having

a second FET-transistor having its gate controlled by a particular voltage for being permanently biased to conduction, and serially connected to the first transistor, the common drain-to-source junction of the first and second transistors being isolated from any other non-ground external bias for maintaining the second FET non-conducting except upon drop to ground or near ground potential of the potential at said junction, so that the potential of the drain of the second MOSFET is not being applied to any other MOSFET in the chip under conditions of conduction of the second FET transistor; and

said serially connected first and second transistors being connected between ground and said terminal, so that said excess biasing voltage is applied to the drain of the second FET and for non-conductive first transistor the effective voltage across its main electrodes is composed of said biasing voltage as reduced by the gate voltage as applied to the gate of said second transistor.

2. Circuit as in claim **1**, wherein a voltage breakdown device is connected to said output terminal.

3. Circuit as in claim **2**, wherein the voltage breakdown device is connected to said output terminal via a passive circuit.

3,867,647

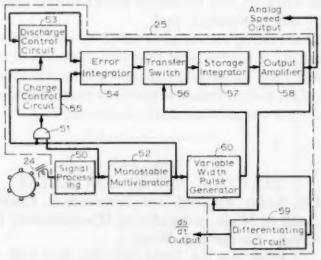
ANALOG SPEED DETECTOR

Bernard E. Callahan, Hoffman Estates, and Philip M. Higgins, Chicago, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed May 29, 1973, Ser. No. 364,298

Int. Cl. H03k *5/18*

U.S. Cl. 307—233 A **16 Claims**



1. A speed detector for producing from an input signal having a repetition rate related to the actual speed of a moving vehicle an analog output signal indicative of the speed of said vehicle, comprising, in combination:

means responsive to said input signal for generating a control signal defining first and second operating periods;

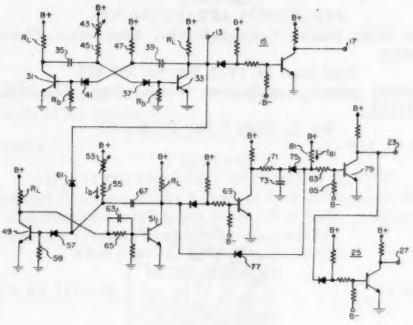
error detection means for generating an error signal, said error signal progressively changing during said first operating period from a first predetermined initial voltage level to a final voltage level, said final voltage level being dependent on the duration of said first operation period and on the rate at which said error signal progressively changes, and remaining at said final voltage level during at least a portion of said second operation period;

integrator means for developing an output signal having a level dependent on the amplitude and polarity of momentarily applied signals;

means for applying said error signal at said final voltage level to said integrator means during at least a portion of said second operating period; and

means responsive to the output signal developed by said integrator means for controlling the rate at which said error signal progressively changes during said first operating period such that said output signal developed by said storage means comprises an analog signal indicative of the speed of said vehicle.

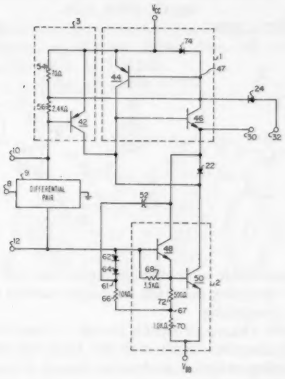
3,867,648
PULSE WIDTH SHORTENING CIRCUIT
Gerald A. Christenson, Lombard, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Division of Ser. No. 375,253, June 29, 1973, Pat. No. 3,818,367. This application Jan. 2, 1974, Ser. No. 429,995
Int. Cl. H03k *5/04*
U.S. Cl. 307—266 **1 Claim**



1. Apparatus for developing output pulses of reduced pulse width responsive to corresponding input pulses of larger pulse width comprising:
a capacitor developing a control potential representative of the charge stored therein responsive to the input pulse being coupled thereto,
the capacitor being charged during intervals between the input pulses and discharged at a predetermined rate during intervals coinciding with the input pulses;
an amplifier,
the amplifier having a biasing arrangement for developing a bias current to maintain the amplifier in an ON state;
first switching means coupled to the amplifier for diverting the bias current from the amplifier during intervals between the input pulses to turn the amplifier OFF; and
second switching means coupled between the capacitor and the amplifier for diverting the bias current from the amplifier to turn the amplifier OFF responsive to the control potential falling below a switching threshold.

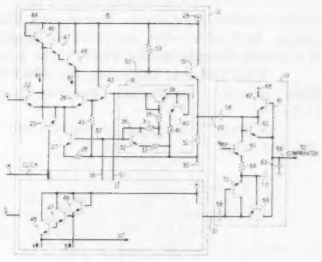
3,867,649
DRIVER
David S. Cochran, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Sept. 26, 1973, Ser. No. 400,750
Int. Cl. H03k *5/12*
U.S. Cl. 307—268 **7 Claims**

1. A driver comprising:
a first output level amplifier having an input and an output;,
a sec .d output level amplifier having an input and an output connected to the input of the first ouput level amplifier;
a first unidirectional conducting device having an anode connected to the output of the first output level amplifier and having a cathode connected to the output of the second output level amplifier;
a threshold detector;
a second unidirectional conducting device having an anode connected to the input of the second output level amplifier and having a cathode connected to the threshold detector; and
a feedback capacitance coupled in series with the threshold



detector and between the threshold detector and the output of the first output level amplifier.

3,867,650
COMPOUND TRANSISTOR CONNECTION LOADING FOR A CURRENT
Gary Lee Baldwin, Wall Twp., Monmouth Co., N.J., assignor to Bell Telephone Laboratories Inc., Murray Hill, N.J.
Filed Dec. 3, 1973, Ser. No. 421,027
Int. Cl. H03k *5/20, 13/22, 17/62*
U.S. Cl. 307—235 **10 Claims**

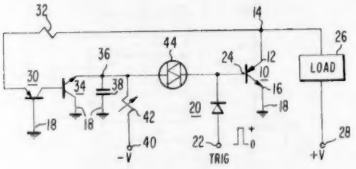


1. In combination
a differential amplifier having first and second current paths,
means for biasing said amplifier to be responsive to first and second input signal levels for routing amplifier current to one or the other of said first and second paths, respectively,
a compound transistor connection including plural cascade-connected amplifier stages, said stages including a diode-connected transistor input stage,
means for connecting said input stage in series in said first current path,
means for connecting the final one of said cascaded stages in series in only said second current path, and
means for deriving an output signal from one of said paths.

3,867,651
MONOSTABLE SWITCHING CIRCUIT

Jack Edward Wojslawowicz, Bayonne, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,878
Int. Cl. H03k 3/26
U.S. Cl. 307—273 16 Claims



1. A monostable switching circuit for use with a load and a source of operating potential to control current flow through the load, comprising:

a bistable electronic switch having a conduction path for connection in circuit with the load and the source of operating potential, said switch having a control terminal responsive to a first polarity trigger signal for placing the path in a first conductive state and responsive to a second polarity trigger signal for placing the path in a second conductive state;

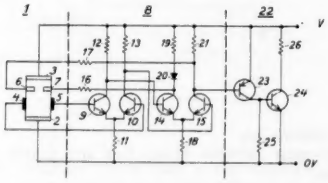
means for applying said first polarity trigger signal to said control terminal; and

circuit means responsive to an externally supplied control signal and to the conductive state of said path for producing and applying said second polarity trigger signal to said control terminal a predetermined time, which is a function of the value of said externally supplied control signal and is substantially independent of said current flow through said load, after application of said first polarity trigger signal.

3,867,652
CONTACTLESS SWITCH

Fritz Lars Gunnar Bjorklund, Tyreso, and Olaf Sternbeck, Bromma, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 16, 1973, Ser. No. 406,856
Claims priority, application Sweden, Nov. 3, 1972, 14271/72
Int. Cl. H03f 15/00; H01v 5/00
U.S. Cl. 307—309 3 Claims

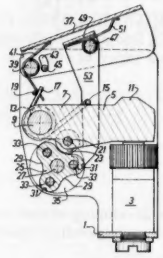


1. Contactless switch comprising a Hall-effect element that has a pair of input electrodes for applying a supply voltage to generate a current in an internal current path and at least one output electrode located adjacent the current path to derive a Hall-potential when an external magnetic field influences the current laterally, and an amplifier circuit that is controlled by the Hall-potential, the Hall-effect element being provided with at least one control electrode controlling the magnitude of said current and the amplifier circuit being provided with at least one output terminal connected to said control electrode of the Hall-effect element for feeding back an amplified Hall-potential in such a phase that the amplifier circuit is provided with positive feedback, the amplifier circuit further comprising a two-terminal device that has a voltage drop with a temperature coefficient of the same sign and at least the same magnitude as the Hall-potential of the Hall-effect element and that is connected to said output terminal of the amplifier circuit in such a way that it constitutes a load for the amplified Hall-potential.

3,867,653
PERCUSSION ARRANGEMENTS

Karl Heinz Duetze, Cessenas-Servier, Saint-Jorioz, France 74410

Filed Sept. 19, 1973, Ser. No. 398,801
Claims priority, application France, Sept. 27, 1972, 72.34166
Int. Cl. H04r 17/00; H03k 3/00
U.S. Cl. 310—8.7 7 Claims



1. A percussion arrangement for piezo-electric apparatus, especially for lighters, comprising a piezo-electric element, a pivotal hammer resiliently urged into contact with the piezo-electric element, a rotatable cam in contact with the hammer and which comprises at least one sector having a first portion whose profile extends from the axis of rotation of the cam so as to move the hammer away from the piezo-electric element, and a second portion whose profile approaches the axis of rotation to allow the hammer to drop onto the piezo-electric element, a pivotal thumb piece resiliently urged away from the hammer and cam, and drive means coupled to said thumb piece for bearing against said cam to effect rotation of the cam when the thumb piece is displaced, the cam being freely rotatable and being disconnected

from the drive means at the instant when the hammer approaches the piezo-electric element to strike the same.

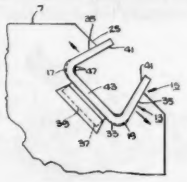
3,867,654
DYNAMOELECTRIC MACHINE STATOR

Charles W. Otto, Dekalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 246,315, April 21, 1973, abandoned. This application Sept. 24, 1973, Ser. No. 400,050
Int. Cl. H02k 1/12
U.S. Cl. 310—42 23 Claims

3. A stator for a dynamoelectric machine having at least one end frame comprising a stack of laminations having opposite end faces, a plurality of openings in the stack between the end faces thereof, means in at least some of the openings for holding the laminations generally in their stacked positions, and means mounted in the openings for supporting engagement with the one end frame including means urged into engagement with the stack within the openings for preventing displacement of the supporting means generally radially of the

openings, and other means respectively engaged with at least a portion of the opposite end faces about the openings for



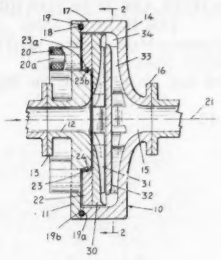
preventing displacement of the supporting means generally axially of the openings.

3,867,655

SHAFTLESS ENERGY CONVERSION DEVICE

Rudolph F. Stengel; Linda F. Stengel, both of Woodland Hills, and Howard Assel, Laguna Beach, all of Calif., assignors to Entropy Limited, Toronto, Ontario, Canada

Filed Nov. 21, 1973, Ser. No. 417,950
Int. Cl. H02k *7/00*
U.S. Cl. 310—66 **9 Claims**



1. An energy conversion device adapted to selectively convert fluid pressure energy into electrical energy in a generator mode and electrical energy into fluid pressure energy in a pump mode, the device having a hollow toroidal body with first and second opposed openings located on a common central axis, the body enclosing the following elements located on the central axis in parallel planes extending perpendicular to the central axis in the following order between the first and second openings:

a. a plurality of circularly spaced electromagnetic coils fixed to said body around said first opening, the coils adapted to be connected to electrical power supply means in the pump mode and to electrical energy receiving means in the generator mode;

b. a rotatably located circular conductive rotor having a central aperture therethrough;

c. a circular impeller having a central aperture therethrough fixed to said rotor, said impeller having a plurality of spaced narrow radial blades extending transversely away from said rotor; and

d. a diffuser fixed to said body, said diffuser having a circular plate spaced adjacent the impeller blades and a plurality of spaced curved radial vanes secured transversely to the plate to extend away from the impeller;

the power supply means adapted to produce a travelling electromagnetic wave which rotates about said central axis adjacent said coils to cut conductive paths of said rotor when the rotor has angular motion relative to said travelling electromagnetic wave,

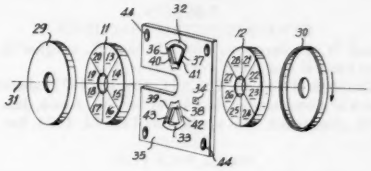
the device providing a reversible fluid flow path therethrough between the first and second openings having a first axial portion, a radial outward portion, a radial inward portion and a second axial portion.

3,867,656

BRUSHLESS DIRECT CURRENT MOTOR

Yoshihiro Mitsui, and Hiroshi Kamakura, both of Matsumoto, Japan, assignors to Kabushiki Kaisha Siwa Seikosha, Ginza and Kabushiki Kaisha Siwa Seikosha, Chuo-ku, both of, Japan

Filed Dec. 13, 1972, Ser. No. 314,626
Claims priority, application Japan, Dec. 13, 1971, 46-100244; Dec. 13, 1971, 46-100245
Int. Cl. H02k *11/00*
U.S. Cl. 310—68 **12 Claims**



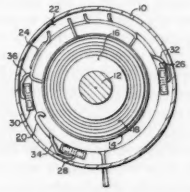
1. A brushless direct current motor comprising a rotor rotatable about a rotary axis and carrying magnetic circuit means defining a gap through which a magnetic field flows in a direction substantially parallel to said rotary axis; a flat stator plate positioned within said gap and having driving coil means and magnetic sensitive element means mounted thereon in said gap to thereby be within said magnetic field, said magnetic sensitive element means including at least one Hall element and is adapted to detect the condition of said magnetic field when said rotor is still and moving to produce a detecting signal in response thereto; and circuit means interconnecting said driving means and magnetic sensitive element means for applying a driving current to said driving coil means in response to said detecting signal.

3,867,657

GENERATOR HAVING SHIELDED CURRENT TRANSFORMERS POSITIONED THEREIN

William W. Yates, Lima, and Herman J. Braun, Cridersville, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 29, 1974, Ser. No. 456,424
Int. Cl. H02k *11/00*
U.S. Cl. 310—68 D **5 Claims**



1. An electromechanical generator comprising:

a rotor;

a stator assembly having a magnetic core and a winding structure extending from said magnetic core, said stator assembly being disposed around said rotor;

a flux shield constructed of a non-magnetic, electrically conductive material, said flux shield having a bottom portion and side portions extending from said bottom portion, said flux shield being disposed substantially adjacent to the winding structure which extends from said magnetic core; and,

a closed magnetic core with a layered winding disposed thereon, said closed magnetic core and layered winding structure being positioned between the sides of said flux

shield, with substantially one-half of the layers of the layered winding progressing in one direction and the other layers progressing in the opposite direction for providing a winding which does not have any net turns which would be linked by magnetic flux which is directed perpendicular to the bottom portion of the flux shield;

said bottom portion of said flux shield having an opening therein through which a lead from said stator winding structure extends to provide inductive coupling between the lead and the layered winding on the closed magnetic core.

3,867,658

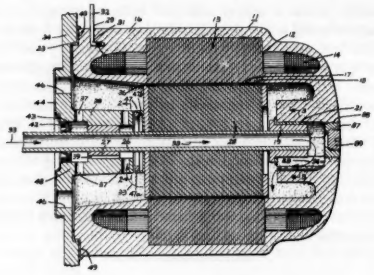
DYNAMOELECTRIC MACHINES

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 217,604, Jan. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 6,660, Jan. 29, 1970, abandoned. This application Feb. 14, 1973, Ser. No. 332,508

Int. Cl. H02k *11/00*

U.S. Cl. 310—71 **7 Claims**



1. A structural assembly comprising a dynamoelectric machine stator assembly; a movable assembly; at least one bearing means for mounting the assemblies for relative motion; a substantially rigid member formed for connecting the at least one bearing means and stator assembly together, for protecting the stator assembly from impact loads applied to the dynamoelectric machine, and for aiding in the effective dissipation of heat from the stator assembly generated during operation of the dynamoelectric machine; and securing means embedded in the substantially rigid member to provide for fastening together the dynamoelectric machine with another device; said substantially rigid member including an impact resistant self-supporting substantially rigid mass of inert particulate material held together and secured to the stator assembly, said substantially rigid member providing effective heat dissipation when the dynamoelectric machine is operated, and said substantially rigid member comprising from about 65 to about 80 percent by weight of inert particulate material and from about 20 to about 35 percent by weight of resinous material, and the particulate material comprises at least about 50% by weight 40 to 100 mesh size particles said securing means includes a plastic member having at least one aperture for receiving a fastening means.

3,867,659

BRUSH HOLDER ASSEMBLY

Duane M. Seaburg, Oakfield, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Aug. 6, 1973, Ser. No. 386,154

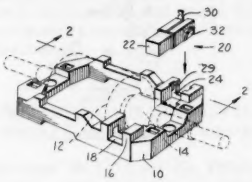
Int. Cl. H02k *13/00*

U.S. Cl. 310—242 **6 Claims**

1. For use in an electric motor frame with commutator brushes, an improved brush holder assembly comprising,

groove means having a complete open top disposed in said frame,

channel means in the side of said groove means extending towards and terminating below the top of the groove to define an overhang below said top,



a tubular brush holder formed to fit said groove means,

flexible tab means comprising lances struck out of the sides of the brush holder and opening upwardly of the fixed position of said brush holder,

whereby said holder may be pressed down from above against the groove bottom with the tab means deflecting into the channel means and then locking below the overhang to locate and fix the holder in the groove.

3,867,660

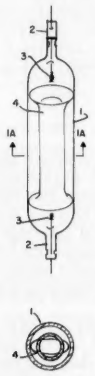
DOUBLE CHAMBER ARC TUBE FOR HIGH INTENSITY DISCHARGE LAMP

Timothy Fohl, Carlisle, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Aug. 13, 1973, Ser. No. 387,934

Int. Cl. H01j *1/02*

U.S. Cl. 313—12 **9 Claims**



1. A high intensity arc discharge lamp comprising an elongated, double chamber arc tube, said arc tube containing an electric-discharge-supporting fill and having electrodes at its ends, the shape of the arc tube being such that during normal operation of the lamp in a position having a vertical component, upward convection flow of the gaseous and vaporized arc tube fill occurs within one chamber of the arc tube and downward convection flow occurs within the other chamber, the arc discharge being confined in said one chamber and being excluded from said other chamber.

3,867,661

QUICK WARM-UP LAMP

Allen R. Waltz, San Diego, and Robert A. Eckel, Cupertino, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

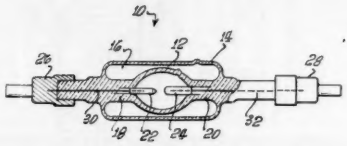
Filed Oct. 19, 1973, Ser. No. 408,218

Int. Cl. H01j *61/30*

U.S. Cl. 313—26 **6 Claims**

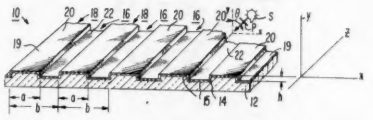
1. A quick warm-up lamp comprising:

a bulb;
a cathode and an anode mounted within and at opposite ends of the bulb in a spaced apart relationship;
a jacket disposed about the entire bulb so as to provide an insulative space between the bulb and the ambient environment;



each end of the bulb being molded integrally with the jacket into a solid neck which extends from the respective end and is located within said jacket; and
a lead extending through each neck and connected to the cathode and the anode respectively.

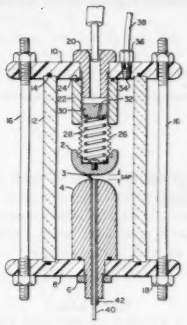
3,867,662
GRATING TUNED PHOTOEMITTER
John Guiry Endriz, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Oct. 15, 1973, Ser. No. 406,183
Int. Cl. H01j *39/00*
U.S. Cl. 313—94 **17 Claims**



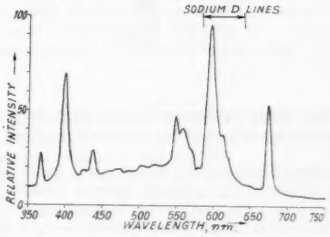
1. A photoemitter for emitting electrons in response to an incident light wave impinging thereon, comprising:
a highly reflective medium having periodic discontinuities dimensioned to achieve energy coupling from an incident light wave impinging on a surface of said medium to a surface wave confined to propagate along and be absorbed into photoemissive material of the photoemitter to excite a tuned peak of electron emission therefrom at at least one discrete and preselected wavelength of said incident light, said discontinuities having a periodicity of spacing substantially equal to the wavelength of said surface wave at at least one tuned peak of electron emission.

3,867,663
WIDE RANGE PRESSURE CONTROLLED SPARK GAP
Willard E. Spencer, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed May 14, 1973, Ser. No. 360,304
Int. Cl. H01j *1/88*
U.S. Cl. 313—146 **9 Claims**

7. An adjustable spark gap device for continuous adjustment over a wide range of breakdown voltages comprising a sealed, gas-tight enclosure, a pair of electrodes in said enclosure disposed to form a spark gap therebetween, at least one of said electrodes being mounted for movement toward and away from the other electrode, a compressible bellows device in the enclosure, said one electrode being mounted on said bellows, means for maintaining substantially constant pressure within the bellows device, the bellows device including means for resiliently opposing compression of the bellows, and means for admitting gas into the enclosure at a controlled and adjustable pressure to simultaneously adjust said gas pressure and the spacing between said electrodes.



3,867,664
ELECTRIC DISCHARGE DEVICES
Alan George Chalmers, and David Osborn Wharmby, both of London, England, assignors to Thorn Electrical Industries Limited, London, England
Filed Jan. 21, 1974, Ser. No. 434,927
Claims priority, application Great Britain, Jan. 23, 1973, 3469/73
Int. Cl. H01j *61/18*
U.S. Cl. 313—229 **5 Claims**

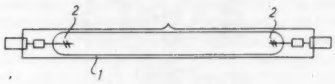


1. A high-pressure electrical discharge lamp comprising:
a light-transmitting discharge vessel;
spaced electrodes in said vessel;
amd a gass fill in said vessel comprising mercury vapour, rare gas, aluminium halide and at least one alkali metal halide.

3,867,665
MERCURY DISCHARGE LAMP COMPRISING MAGNESIUM HALIDE
Kenneth Frederick Furmidge, and Eric John George Beeson, both of London, England, assignors to Thorn Electrical Industries Limited, London, England
Continuation-in-part of Ser. No. 256,006, May 23, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 418,122
Claims priority, application Great Britain, July 5, 1973, 32104/73
Int. Cl. H01j *1/54, 61/20*
U.S. Cl. 313—485 **30 Claims**

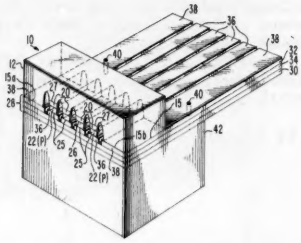
1. An ultra-violet emitting mercury vapour discharge lamp, comprising:

an ultra-violet transmitting lamp envelop;
a discharge electrode system within said envelope; and
an atmosphere withing said envelope, said atmosphere comprising mercury vapour and magnesium vapour in the



form of a magnesium halide in such proportions as to provide enhanced ultra-violet emission, and an inert gas filling to initiate electron discharge, said magnesium being introduced into said lamp, as magnesium metal together with another metal halide.

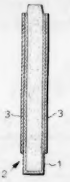
3,867,666
HIGH DENSITY LIGHT EMITTING DIODE ARRAY
Paul Nyul, New Holland, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Mar. 19, 1974, Ser. No. 452,545
Int. Cl. H05b *33/00*
U.S. Cl. 313—500 **6 Claims**



1. A high density light emitting diode array comprising:
a conductive substrate having a recess in a surface thereof, and
a plurality of light emitting diodes, each of said light emitting diodes having regions of opposite conductivity type which form a PN junction, each of said regions having a surface and each light emitting diode having a light emitting end surface, said light emitting diodes being mounted in spaced relation in said recess of said substrate with the surfaces of one of the regions of the same conductivity being in electrical contact with said substrate, the surfaces of the regions of the opposite conductivity being substantially coplanar with at least a portion of said surface of said substrate, and said light emitting end surfaces facing in substantially the same direction.

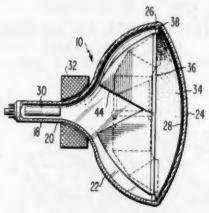
3,867,667
CARBON ELECTRODE FOR AN ARC LAMP
Shigeru Suga, Yoyogi 5-20-2, Shibuya-ku, Tokyo, Japan
Filed Mar. 4, 1974, Ser. No. 448,049
Int. Cl. H05b *31/06*
U.S. Cl. 314—60 **1 Claim**

1. A carbon electrode comprising:
a carbon electrode bar having at one end thereof a discharge tip and having at the other end thereof an electrode holding section;
a first coating on all the peripheral surfaces of said bar other than said discharge tip, said coating material being from the group consisting of aluminum and alloy consisting predominantly of aluminum; and
a second coating of material taken from the group consisting of aluminum oxide and silicon oxide coating all the



peripheral surfaces of said bar other than said discharge tip and said electrode holding section.

3,867,668
CATHODE-RAY TUBE HAVING AN INTERNAL-EXTERNAL MAGNETIC SHIELD AND DEGAUSSING COMBINATION
Terry Monroe Shrader, Leola, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Nov. 29, 1973, Ser. No. 420,324
Int. Cl. H01j *29/06*
U.S. Cl. 315—8 **7 Claims**

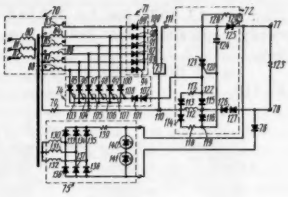


1. In a shadow mask type cathode-ray tube, the improvement comprising,
an internal-external magnetic shield and degaussing coil combination including,
an internal shield portion interconnected to said mask, said internal shield having an opening therein remote from said mask, the opening including two opposite gaps extending towards said mask, and
two external shield portions overlapping said internal shield portion and covering the gaps in said internal shield portion, each of said external shield portions extending along a side of said tube and having a degaussing coil thereon.

3,867,669
POWER SOURCE WITH A SPARKPROOF OUTPUT
Yakov Lvovich Krasik, Universitetskaya ulitsa, 54, kv. 41; Leonid Iosifovich Rappoport, ulitsa Schorsa, 69, kv. 23; Anatoly Nikolaevvich Gelbin, ulitsa Schorsa, 61, kv. 42; Nikolai Andreevich Marsjuk, ulitsa Stadionnaya, 8, kv. 64; Anatoly Nikitovich Gura, ulitsa Kooperativnaya, 114, kv. 33, and Boris Mefodievich Kirichenko, ulitsa kapitana Ratnikova, 28, kv. 4, all of Donetsk, U.S.S.R.
Filed Jan. 11, 1974, Ser. No. 432,651
Int. Cl. H02h *7/10*
U.S. Cl. 317—16 **2 Claims**

1. A power source with a sparkproof output, comrpising: a transformer; a rectifier connected to the output of said transformer; spark proofing circuit means for limiting electric energy released in the course of commutation of an output circuit of said power source and incorporating an inductive element and thyristors; said spark proofing circuit means being connected to the output of said rectifier; and automatic

reclosing circuit means for restoring output electric parameters of said power source following operation of said spark proofing circuit means and comprising additional thyristors and diodes; each of said additional thyristors being connected



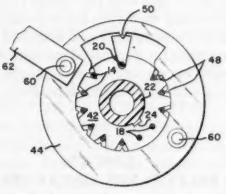
in parallel with a respective output winding of said transformer, the number thereof corresponding to that of the output windings of said transformer; said diodes being connected to control circuits of said additional thyristors.

3,867,670

MULTIPLE SPARK GAP PROTECTIVE DEVICE

Ferdinand William Schor, Goleta, and Tore Rudolf Johnson, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 12, 1973, Ser. No. 396,944
Int. Cl. H02h *9/06*
U.S. Cl. 317—61.5 **1 Claim**



1. A multiple apark gap protective device for protecting solid state circuitry associated with cathode ray tubes from high voltage discharges, in combination with a cathode ray tube having a plurality of pins on the base thereof and an insulating socket body containing therein a plurality of contacts connected to said circuitry and adapted to engage said pins, said device comprising:

an insulating substrate having a keyed central aperture surrounded by a circular configuration of a plurality of lesser apertures equal in number to pins on said cathode ray tube, each said lesser aperture being substantially triangular in plan view with an apex of said triangles directed radially inwardly of said substrate;

a metallic plate fixed to said substrate and having a central aperture of larger dimension than said circular configuration of lesser apertures in said substrate and a plurality of radially inwardly directed projections aligned with at least some of said lesser apertures of said substrate and extending over said lesser apertures in cantilevered fashion; and a ground strap one end of which is fixed to said metallic plate and the other end of which is connected to ground potential,

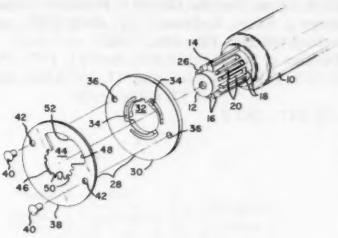
said device being mounted between said tube and said socket with said pins passing through said lesser apertures closely adjacent said inwardly directed apexes whereby a plurality of spark gaps are formed between said projections and the pins of a cathode ray tube.

3,867,671

SPARK GAP PROTECTIVE DEVICE FOR CATHODE RAY TUBES

Tore Rudolf Johnson, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 19, 1973, Ser. No. 417,029
Int. Cl. H02h *9/06*
U.S. Cl. 317—61.5 **1 Claim**



1. A multiple spark gap protective device for protecting solid state circuitry associated with cathode ray tubes from high voltage discharges from such tubes comprising:

an insulating substrate having a keyed central aperture and a plurality of resilient centering means disposed about the periphery of said aperture, said resilient centering means including a plurality of arcuate cantilevered arms integral with said substrate and disposed about the periphery of said aperture;

a metallic plate secured to said insulating substrate including a central aperture having a plurality of radially inwardly directed projections extending over the central aperture of said substrate in cantilever fashion whereby a plurality of spark gaps are formed between said projections and pins of a cathode ray tube when said device is mounted on the base of said tube; and

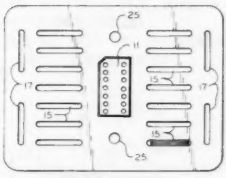
common ground means secured to said plate.

3,867,672

INTEGRATED CIRCUIT BREADBOARD MODULE

Alfred Pizzigoni, North Bergen, N.J., assignor to Stephen Horbach and Company, Lyndhurst, N.J.

Filed Aug. 9, 1973, Ser. No. 386,978
Int. Cl. H05k *5/00*
U.S. Cl. 317—101 CC **7 Claims**



1. An integrated breadboard assembly particularly useful for breadboarding linear integrated circuits comprising:

a. a printed circuit having a plurality of conductors thereon each adapted to accept one terminal of an integrated circuit at one end and a further connection at the other end;

b. an integrated circuit socket attached to said printed circuit board with terminals at said one ends of said conductors;

c. a terminal clip divided into three sections to permit acceptance of different size wires attached to each of the other ends of said conductors; and

d. a solder-resistant plastic case enclosing said printed circuit board, socket and terminal clips, said case including openings in the top through which said socket and terminal clips project.

3,867,673

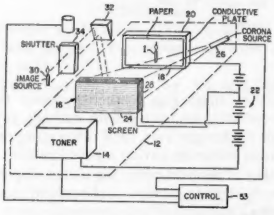
METHOD AND APPARATUS FOR FORMING A POSITIVE ELECTROSTATIC IMAGE

Hewitt D. Crane, Portola; Gerald L. Pressman, Cupertino, and George J. Eilers, Redwood City, all of Calif., assignors to Electroprint, Inc., Palo Alto, Calif.

Division of Ser. No. 197,877, Nov. 11, 1971, Pat. No. 3,713,734. This application Aug. 17, 1972, Ser. No. 281,605

Int. Cl. G03g *15/00*

U.S. Cl. 317—262 R **9 Claims**



1. Apparatus for controlling the flow of electrostatically charged particles along a path comprising, in combination, means for establishing a first electric field across a first insulator layer so polarized as to prevent movement of particles along the path; and means for establishing a second electrical field across a second insulator layer in spaced superposition to said first insulator, said second electrical field selectively counteracting said first electric field in accordance with an image to be reproduced.

3,867,674

PROCESS FOR THE ELECTROGRAPHIC RECORDING OF CHARGE IMAGES

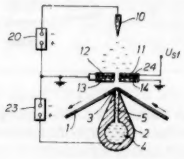
Walter Simm, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 26, 1973, Ser. No. 373,681

Claims priority, application Germany, June 28, 1972, 2231530

Int. Cl. H05

U.S. Cl. 317—262 A **19 Claims**



15. A contact electrode for helping produce an electric charge distribution on an insulating web which moves in contact relative to the electrode comprising a body, a relatively thin edge on the body contacting the web, and a channel within the thin edge for supplying a conductive liquid to the area of the web contacted by the thin edge.

3,867,675

MAGNETIC DRIVE MECHANISMS FOR PRINTING HEADS

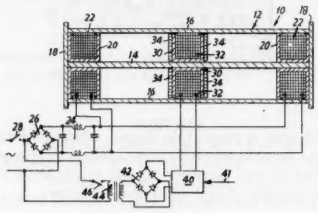
Norbert Kitz, and James John Drage, both of Uxbridge, England, assignors to Bell Punch Company Limited, Uxbridge, England

Filed Aug. 13, 1973, Ser. No. 388,664

Claims priority, application Great Britain, Aug. 18, 1972, 38759/72; Nov. 17, 1972, 53193/72

Int. Cl. H02k *33/00, 41/00*

U.S. Cl. 318—119 **5 Claims**



1. A drive mechanism for moving a print head over a longitudinal path comprising in combination, a first elongated member in the form of a length of magnetic material such as mild steel disposed parallel to said path, a second elongated member in the form of a length of magnetic material such as mild steel disposed parallel to said path and spaced from said first member, means disposed for producing a magnetic field coaxially through the length of one said member and with the two said members located in a closed magnetic path for the magnetic field, and a movable print head carriage mounted on a selected one of said members for movement over said path comprising an electromagnetic coil disposed coaxially around the selected member for control of movement of said carriage along said path by means of a magnetic field generated thereby reacting with said magnetic field through the length of said member.

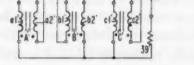
3,867,676

VARIABLE RELUCTANCE LINEAR STEPPER MOTOR

Hi D. Chai, Binghamton, and Joseph P. Pawletko, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 20, 1973, Ser. No. 399,225

U.S. Cl. 318—135 **8 Claims**



1. A linear stepper motor having a predetermined reference axis and being of the variable reluctance type, said motor comprising:

first magnetic member means having first and second surfaces disposed on first and second opposite sides, respectively, of said reference axis, said first member means having a predetermined variable reluctance characteristic at said first and second surfaces,

second magnetic member means having an odd plural number of pole pairs of electromagnetic poles with respective pole faces, the pole face of one pole of each said pole pair being disposed on said first side of said reference axis in

juxtaposition with said first surface, the pole face of the other pole of each said pole pair being disposed on said second side of said reference axis in juxtaposition to said second surface,

a predetermined one of said first and second member means having first and second spaced sub-members disposed on said first and second opposite sides, respectively, of said reference axis, the other one of said first and second member means being disposed between said first and second sub-members,

means for supporting said first and second member means for relative movement therebetween along said axis,

each of said poles having first and second windings associated therewith, the said first windings of the poles of each particular pole pair being electrically interconnected in series aiding relationship, the second windings of the poles of each particular pole pair being electrically interconnected in series aiding relationship, and

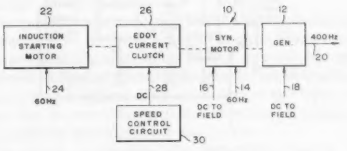
means for selectively energizing in respective predetermined stepping sequences said series connected first and second windings for at least one of the operational modes of single phase, double phase and alternate single phase and double phase energizing operational modes to provide relative movement between said first and second member means, said selective energizing means being operative during each one of said operational modes to energize said series connected first windings of each particular pole pair in a direction opposite to the direction of energization of the series connected second windings of that particular pole pair, and said selective energizing means during each successive step being operative to energize the series connected windings selected during such successive step to provide a magnetic flux in the same direction through the pole pair associated with the series connected windings selected in the preceding step as the direction of the magnetic flux passing through the lastmentioned pole pair during said preceding step.

3,867,677

MOTOR RUN-UP SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and John J. Daeges, 309 Fowler Dr., Monrovia, Calif. 91016

Filed Mar. 7, 1974, Ser. No. 449,118
Int. Cl. H02p *1/00*
U.S. Cl. 318—137 **8 Claims**



1. Motor apparatus comprising:

a synchronous motor having an armature and field;

a starting motor;

an eddy current clutch coupling having first and second inputs, for generating a count dependent upon the difference in pulse separations on said inputs;

first means coupling the power line to said first input of said counter;

second means for coupling the armature of the synchronous motor to the second input of said counter, so that the generated count represents the difference in frequency between current on the power line and current generated by the synchronous motor;

a first latch connected to said counter to retain the count;

a digital-to-analog converter;

third means for coupling the latch to the input of said converter; and

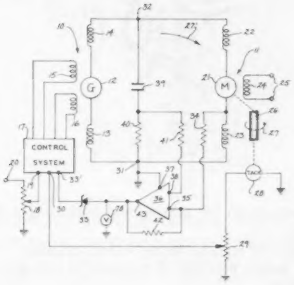
fourth means for coupling the output of said converter to said eddy-current clutch.

3,867,678

METHOD AND MEANS FOR MEASURING THE TORQUE DELIVERED BY AN ELECTRIC MOTOR

Thomas A. Stoner, Brookfield, Wis., assignor to Bucyrus-Erie Company, Milwaukee, Wis.

Filed Feb. 15, 1973, Ser. No. 332,697
Int. Cl. H02p *5/28*
U.S. Cl. 318—432 **7 Claims**



1. A method of generating a signal proportional to the force delivered to a load driven by an energy conversion machine, the steps comprising:

indirectly sensing the force induced by said energy conversion machine and generating an electrical signal proportional to said induced force;

indirectly sensing the acceleration force generated by the inertias of the energy conversion machine and load, and generating an electrical signal proportional to said acceleration force; and

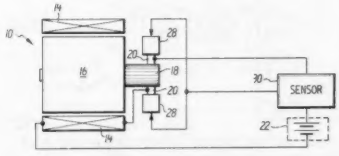
arithmetically summing the electrical signals representing induced force and acceleration force to provide a signal proportional to the total force delivered to the load.

3,867,679

MOTOR FIELD STRENGTH VARIABLE BRUSH PRESSURE APPARATUS AND METHOD

Stephen Hagar Smith, San Pedro, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed July 11, 1973, Ser. No. 378,047
Int. Cl. H01r *39/42*
U.S. Cl. 318—542 **11 Claims**

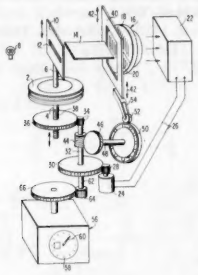


1. In a direct current or universal electric motor having an armature and commutator brushes, a method of increasing motor efficiency while operating the motor at loads less than rated loads by (a) detecting motor load, and (b) modifying the pressure of the brushes on the communtator of the motor as a function of the detected motor load.

3,867,680
INSTRUMENTATION SYSTEM CONTAINING A NULL SHIFTING MEANS

Paul B. King, Mountain Lakes, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed May 22, 1973, Ser. No. 362,730
Int. Cl. B64c 13/18
U.S. Cl. 318—584 12 Claims

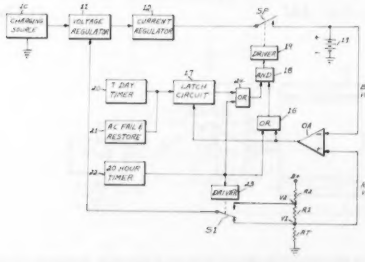


1. An instrument for sensing and indicating a parameter, comprising;
   a. a parameter-sensing means which includes:
      a first means movable in response to changes in the parameter,
      a second means for sensing changes in the position of the first means,
      said first and second means being initially positioned at a null position with respect to each other, and
      restorative means for relatively moving said first and second means to restore them to their null position;
   b. a parameter-indicating means changeable in response to movement of the restorative means; and
   c. shifting means for shifting the null position in response to movement of the restorative means, said shifting means producing movement of the restorative means which is proportional to changes in value of the parameter being indicated.

3,867,681
BATTERY CHARGING CIRCUIT

Larry D. Bishop, and William R. Smith, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Mar. 20, 1974, Ser. No. 452,804
Int. Cl. H02j 7/04
U.S. Cl. 320—21 5 Claims

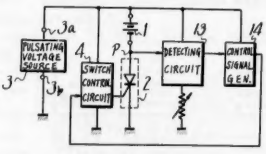


1. An improved circuit for charging a battery from a charging source, comprising:
   a. a voltage regulator adapted to be connected to the charging source, said voltage regulator having a control input for selectively causing said voltage regulator to produce an upper regulated voltage and a lower regulated voltage at its output;
   b. a current regulator connected to said voltage regulator circuit;
   c. a normally open charging path having an input connected to said current regulator, having an output, and having a control input;
   d. means connected to said charging path output and adapted to be connected to the battery to be charged;
   e. a voltage comparator having an input adapted to be connected to said battery to be charged for producing a first charging signal in response to a battery voltage below a selected voltage reference level;
   f. a first timer for producing a second charging signal at selected predetermined intervals;
   g. a power fail and restore circuit for producing a third charging signal in response to failure and subsequent restoral of primary power;
   h. a second timer for producing a fourth charging signal of a selected duration in response to a selected operation;
   i. means connected between said voltage comparator, said first timer, said power fail and restore circuit, and said second timer and between said charging path control input for closing said charging path in response to the simultaneous presence of said first charging signal and either of said second and third charging signals, and in response to said fourth charging signal;
   j. and means connected between said second timer and said voltage regulator control input for causing said voltage regulator to produce said upper regulated voltage in the presence of said fourth charging signal and for causing said voltage regulator to produce said lower regulated voltage in the absence of said fourth charging signal.

3,867,682
BATTERY CHARGER WITH MEANS FOR PREVENTING OVERCHARGING OF THE BATTERY

Hiroyuki Yamauchi, Tokyo, and Masahiro Ohya, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,536
Claims priority, application Japan, Nov. 20, 1972, 47-116326
Int. Cl. H02j 7/10
U.S. Cl. 320—39 6 Claims



1. A battery charger for charging a rechargeable battery comprising a pulsating voltage source, a semiconductor thyristor having an anode-cathode path connected in series with said battery across said pulsating voltage source and having a gate, a thyristor control circuit connected to said gate and having means for rendering said semiconductor thyristor conductive during a portion of each pulse from said voltage source, voltage detecting means including a reference voltage producing means, said voltage detecting means connected to the connecting point between said rechargeable battery and said semiconductor thyristor for detecting the voltage at said connecting point when the pulsating voltage source becomes substantially zero and producing an output when the detected voltage reaches the reference voltage, and means for supplying a control signal in response to the output from said voltage detecting means to said thyristor control circuit to maintain said semiconductor thyristor in a continued non-conductive

state, thereby to stop the charging of said rechargeable battery, said thyristor control circuit comprises a resistor connecting said gate to said pulsating voltage source for supplying said pulsating voltage to said gate as a gate signal and switch means connected to said gate for preventing said gate signal from being supplied to said gate when said control signal is supplied to said thyristor control circuit, said switch means having a control terminal supplied with said control signal, and said thyristor control circuit also including a diode connected between the anode of said semiconductor thyristor and the control terminal of said switch means.

3,867,683

DC-TO-AC-TO-DC-INVERTER

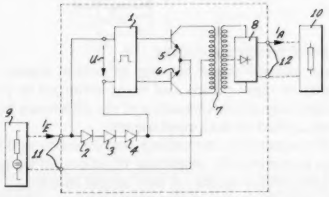
Franz Marchevka, Dortelweil, Germany, assignor to Hartmann & Braun-Mess-und Regeltechnik Aktiengesellschaft, Frankfurt, Germany

Filed Sept. 24, 1973, Ser. No. 400,270

Claims priority, application Germany, Oct. 7, 1972, 2249223

Int. Cl. H02m *3/32*

U.S. Cl. 321—2 **8 Claims**



1. DC-AC-DC inverter with galvanically separated input and output circuits by means of a transformer and having only two input terminals and two output terminals, further having a rectifier for connecting the transformer secondary to the output terminals, two switching transistors for connecting the transformer primary to the input terminals, and a self-starting - self sustaining oscillator connected for controlling the transistors, the oscillator having a pair of power input terminals and a pair of oscillator output terminals, the latter output terminals being connected to control the two switching transistors, so that these two transistors drive input current in alternating directions through the primary, the improvement comprising:

impedance means connected serially and galvanically between one of the inverter input terminals and the transformer primary and being passed through by an input current as flowing through the inverter input terminals for developing a voltage drop upon flow of the input current into the inverter, through the switching transistors and through the transformer primary; and

circuit means connecting the impedance means to the power input terminals of the oscillator for applying the said constant voltage drop to the oscillator to provide power thereto.

3,867,684

PULSE FORMING NETWORK CHARGING CONTROL SYSTEM

Howard S. Ginsberg, Baltimore, Md., and Charles K. Hooper, Inverness, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 7, 1973, Ser. No. 395,315

Int. Cl. H03k *3/64;* **H02p** *13/22*

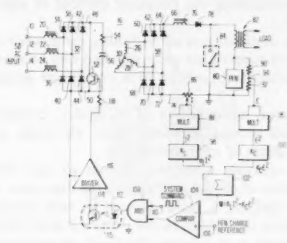
U.S. Cl. 321—19 **10 Claims**

1. Means for controlling the energy supplied to a pulse forming network in a line type modulator having a resonant charging system, comprising:

a controlled source of charging current coupled to said line type modulator for supplying a charging current thereto to charge said pulse forming network;

control means coupled to said controlled source for controlling the electrical energy supplied to said line type modulator;

first circuit means coupled to said line type modulator and being operable to provide a signal proportional to the electrical energy stored in said line type modulator; and second circuit means coupled to said first circuit means and being responsive to said signal proportional to said



stored energy and being operable to generate a control signal, said control signal being coupled to said control means, said control signal operating said control means during a charging mode of operation to render said controlled source operative and couple charging current to said line type modulator when said signal proportional to the stored energy in said line type modulator is below a predetermined value and operating said control means during a second mode of operation to render said controlled source inoperative and thereby interrupt charge current flow when said stored energy reaches a predetermined value.

3,867,685

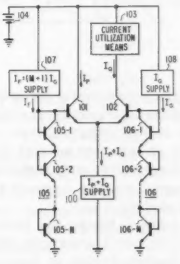
FRACTIONAL CURRENT SUPPLY

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 365,833

Int. Cl. G05f *3/08*

U.S. Cl. 323—4 **19 Claims**



1. A fractional current supply having:

supply means for supplying an operating potential between first and second terminals thereof, one of which terminals provides a common point of interconnection;

a first and a second transistors, each having a base electrode and an emitter electrode with a base-emitter junction therebetween and each having a collector electrode, said emitter electrodes being joined to each other by direct connection;

means for supplying a first current connected between the first terminal of said supply means and said direct connection of the emitter electrodes of said first and said second transistors, poled to forward-bias the base-emitter junctions of said first and said second transistors;

means for direct current conductively coupling the collector electrode of said first transistor to the second terminal of said supply means;

utilization means for a fractional current, said utilization means included in direct current conductively coupling of the collector electrode of said second transistor to the second terminal of said supply means, said fractional current comprising the collector current of said second transistor;

a first serial combination of N diodes, connected between said first transistor base electrode and said common point of interconnection, where N is an integer greater than one;

a second serial combination of N diodes, connected between said second transistor base electrode and said common point of interconnection;

means for applying a second current to said first serial combination of diodes in the forward direction; and

means for applying a third current to said second serial combination of diodes in the forward direction, which third current is in continually fixed proportion to said second current, said proportion being chosen to maintain a larger forward bias potential across the base-emitter junction of said first transistor than across the base-emitter junction of said second transistor.

3,867,686

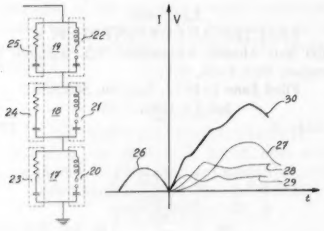
MULTI-FREQUENCY TUNED H.V. SYNTHETIC CIRCUIT FOR TESTING CIRCUIT BREAKERS

Guy St-Jean, Longueuil, Quebec, Canada, assignor to Institut de Recherche de l'Hydro-Quebec (Ireq), Quebec, Canada

Filed Nov. 12, 1973, Ser. No. 414,706

Int. Cl. 315 *191*; **G01r** *31/02*; **H03k** *3/53*

U.S. Cl. 324—28 CB **7 Claims**



1. A high voltage generator used for the synthetic testing of high voltage circuit interrupters, and more particularly for a testing circuit of the current injection type, and capable of providing successively an injection current wave-form and a transient recovery voltage wave-form, comprising:

a. a plurality of partial circuits connected in series, said partial circuits including:

1. an injection branch having an inductance, a precharged capacitor, and a spark-gap, all in series, and

2. a regulating branch having at least a capacitance, connected in parallel with said injection branch;

b. each partial circuit injection branch having a tuned resonant frequency equal to the product of the inductance and capacitance included therein, said product being identical to the product of the total injection branch comprising said series combination of partial circuit injection branches.

c. at least some of said inductances in said partial circuit injection branches being unequal to other inductances therein.

3,867,687

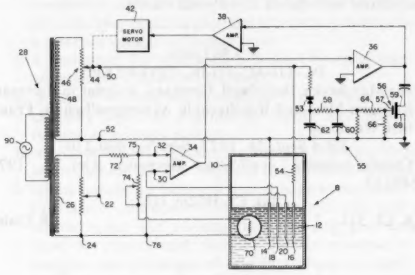
SERVO GAIN CONTROL OF LIQUID CONDUCTIVITY METER

Arthur E. Gealt, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 119,795, March 1, 1971. This application Mar. 19, 1973, Ser. No. 342,774

Int. Cl. G05f *1/10*

U.S. Cl. 324—30 R **10 Claims**



1. A control circuit comprising:

signal comparator means having an output means and a plurality of input means and being arranged to produce an output signal representative of the difference between signals applied to said input means,

means for selectively controlling connected to said output means to control the amplitude of an output signal from said comparator means on said output means,

variable energizing signal producing means connected to said output means of said comparator means and responsive to said output signal from said comparator means to produce a corresponding energizing signal amplitude,

input signal means connected to said energizing signal producing means to receive said energizing signal and arranged to produce an output signal in response to said energizing signal,

first circuit means connected between said variable energizing signal producing means and said means for selectively controlling for applying said energizing signal from said variable energizing signal producing means to said means for selectively controlling to control the amplitude of an output signal from said signal comparator means,

second circuit means connected between said input signal means and one of said input means of said signal comparator means

to apply said output signal from said input signal means as an input signal to said one of said input means of said comparator means,

reference signal means, and

third circuit means connected between said reference signal means and another one of said input means of said signal comparator means to apply an output signal from said reference signal means to said another one of said input means of said signal comparator means to be compared with said output signal from said input signal means.

3,867,688

ELECTRODELESS CONDUCTANCE MEASUREMENT DEVICE

Oscar H. Koski, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

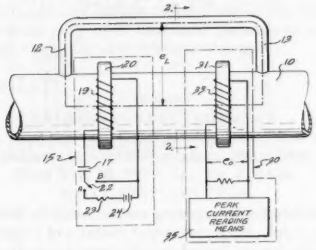
Filed Dec. 18, 1973, Ser. No. 425,919

Int. Cl. G01n *27/42*

U.S. Cl. 324—30 A **4 Claims**

1. A device for inducing a peak voltage across and a peak current in a material so that the conductance G of the material

may be determined, comprising: a first transformer ring core having a primary winding of n turns thereabout, means for applying at time = 0 a first damped oscillatory voltage of peak value e_I across said primary winding of said first core, said peak value e_I occurring the instant after time = 0, a current loop including the material for at least a portion of said current loop, said current loop being positioned to pass through said first core, thereby acting as a secondary winding for said first core so that in response to said first damped oscillatory voltage a first damped oscillatory current is induced in said current loop and a second damped oscillatory voltage appears



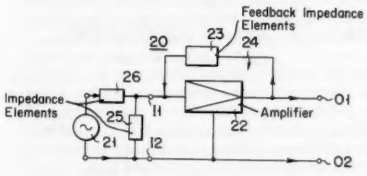
across said current loop of peak value $e_L = e_I/n$, said peak value e_L occurring the instant after time = 0, a second transformer ring core having a secondary winding thereabout, said current loop being positioned to pass through said second core, thereby acting as a primary winding for said second core so that in response to said first damped oscillatory current in said current looped a second damped oscillatory current of peak value i_P is induced in said secondary winding of said second core, and means for measuring i_P coupled to said secondary winding of said second core, with the conductance of said material being $G = i_P/e_L$.

3,867,689

MEASURING APPARATUS UTILIZING VARIABLE IMPEDANCE ELEMENTS

Toshihiro Mori, Yokohama, and Seigo Ando, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,763
Claims priority, application Japan, Aug. 31, 1972, 47-87435
Int. Cl. G01r *33/14*
U.S. Cl. 324—40 **9 Claims**



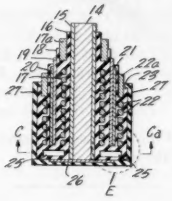
6. The measuring apparatus as claimed in claim **5** wherein said another negative impedance network is coupled in series with said reference impedance element.

3,867,690

HIGHLY DIRECTIONAL PARAMETRIC MAGNETIC SENSOR

Shintaro Oshima, Tokyo; Teruji Watanabe, Niza; Takasuke Fukui, Tokyo, and Shinzuo Suzuki, Kawasaki, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed June 6, 1973, Ser. No. 367,429
Claims priority, application Japan, June 8, 1972, 47-56458
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **6 Claims**



1. A magnetic sensor of the parametrically excited second harmonic oscillator type comprising:

a. a conductor having a straight portion having a central longitudinal axis, said conductor having a magnetic thin film disposed on a surface of said straight portion;

b. a pair of coils comprising an inner coil and an outer coil disposed coaxially with said central longitudinal axis and extending longitudinally of said conductor over a common portion of said straight portion of said conductor;

c. means electrically connecting said pair of coils in series;

d. a hollow cylindrical conductor having a magnetic thin film disposed on an outer surface thereof, said cylindrical conductor being disposed between said inner coil and said outer coil and coaxially with said central longitudinal axis and extending longitudinally of said straight portion of said conductor over a portion common with said coils; and

e. means electrically connecting said conductor with said cylindrical conductor to define a series input circuit, said input circuit receptive in operation of an exciting current for developing oscillations in said pair of coils, said oscillations having a phase determined by a sensed external magnetic field.

3,867,691

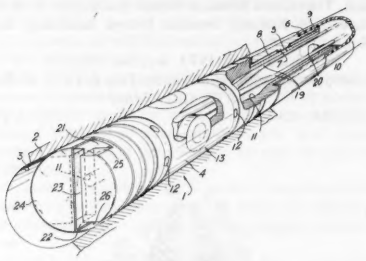
CAPACITIVE PROBE ROTATED BY AIR PRESSURE AND USED TO MEASURE INTERNAL DIAMETER OF A CYLINDER

Jean Max Plessis, Joue Les Tours, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Sept. 28, 1973, Ser. No. 401,989
Claims priority, application France, Oct. 6, 1972, 72.35620
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **9 Claims**

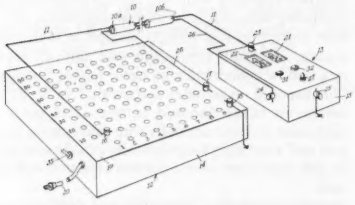
1. A method for ovalization testing of a tube of small diameter and substantial length by measurement of the dimensions of the major axis and the minor axis of the ellipse constituting the transverse cross-section of said tube along a plane at right angles to its longitudinal axis by a cylindrical probe within the tube and capacitive transducers disposed on the probe along two axial reference planes located at right angles to each other, said probe being provided with pneumatic sustentation means for causing the axis of the probe to coincide with the axis of the tube, the steps of subjecting the probe to a torque about its axis, causing the two axial reference planes to coin-

cide with the major axis and the minor axis of the transverse-section ellipse of the tube and then measuring the distance



between the wall of the tube and the transducers in the direction of the axes of the ellipse.

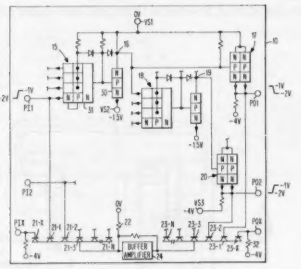
3,867,692
MULTIPLE CABLE CONDUCTOR IDENTIFICATION APPARATUS
Henry Esch, 5823 Satinwood Dr., Columbus, Ohio 43229
Filed Aug. 2, 1973, Ser. No. 384,931
Int. Cl. G01r *31/02, 19/16*
U.S. Cl. 324—66 **5 Claims**



1. A conductor identification apparatus for a multi-conductor cable comprising:

an electrical power source having: a plurality of output terminals with each output terminal selectively connectable to a respective conductor of the multi-conductor cable, a voltage source, a signal generator circuit including a diode matrix having a plurality of outputs interconnected respectively with said plurality of power source output terminals to provide a discrete electrical signal at each said output terminal, said diode matrix further including at least one set of plurality of input terminals, switch means connected with each of said matrix input terminals, said switch means operable to sequentially apply an electrical signal from said voltage source to each input terminal in succession, said diode matrix cumulatively adding to the electrical signal applied to each input terminal all electrical signals applied to each preceding input terminal forming a pulse train of electrical signals at each output terminal in succession with each such pulse train related to the respective input terminal, said identification apparatus further including a readout apparatus connectable to each output terminal independent of the others through the conductors of the cable and responsive to said discrete electrical signals to form an output display indicative of the signal applied to any selected conductor thereby identifying that conductor.

3,867,693
LSI CHIP TEST PROBE CONTACT INTEGRITY CHECKING CIRCUIT
George J. Saxenmeyer, Sr., Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 20, 1974, Ser. No. 444,219
Int. Cl. G01r *31/02*
U.S. Cl. 324—73 R **7 Claims**

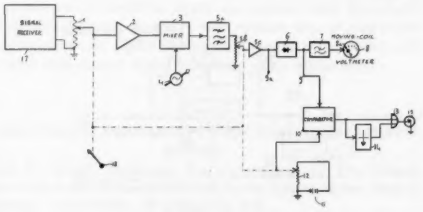


1. A method for determining contact integrity between voltage supply, input and output contacts of a semiconductor chip having logical circuits formed therein and coupled between said input and output contacts, and supply, input and output test probes adapted to be brought into electrical engagement with respective supply, input and output contacts, said method comprising the steps of applying voltage supply and input signals concurrently to the supply and input test probes,

sensing said input signals by means of a logical AND circuit on the chip having its input connected to the input contacts and producing an output signal when said input signals are sensed concurrently by all AND circuit inputs, applying said output signal concurrently to all output contacts,

sensing the output signals on the output test probes to determine whether or not all test probes are in electrical engagement with their respective chip contacts.

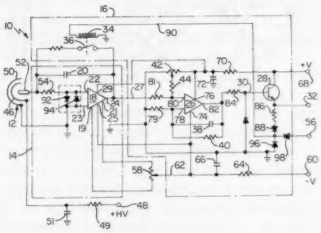
3,867,694
MONITORING CIRCUITRY FOR AMPLITUDE-MEASURING SYSTEM
Werner Rauscher, Reutlingen, Germany, assignor to Wandel u Goltermann, Reutlingen, Muhleweg, Germany
Filed Oct. 9, 1973, Ser. No. 404,678
Claims priority, application Germany, Oct. 12, 1972, 2249928
Int. Cl. G01r *19/16, 19/22*
U.S. Cl. 324—102 **7 Claims**



1. A system for monitoring the amplitude levels of signal channels located within a predetermined frequency band, comprising:

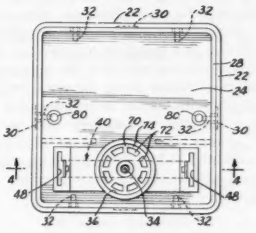
receiver means for signal frequencies within said band;
selector means for progressively tuning said receiver means to different signal frequencies and for generating output voltages proportional to the amplitudes thereof;
threshold means for providing a constant reference voltage;
comparator means connected to said receiver means and to said threshold means;
a monostable multivibrator controlled by said comparator means for producing a monitoring pulse of predetermined duration upon detection of an output voltage exceeding said reference voltage;
indicator means connected to said multivibrator for registering the presence of said monitoring pulse; and
an OR gate inserted between said monostable multivibrator and said indicator means, said OR gate having input connections to said comparator means for extending the operation of said indicator means beyond the end of said monitoring pulse upon continued presence of an output voltage exceeding said reference voltage.

3,867,695
RECYCLING ELECTROMETER
Lowell B. Lay, Jr., and Andrew A. Sanders, both of Tulsa, Okla., assignors to Avco Corporation, Tulsa, Okla.
Filed Nov. 28, 1973, Ser. No. 419,646
Int. Cl. G01r *1/30, 19/26*
U.S. Cl. 324—123 R **4 Claims**



1. A recycling electrometer for providing a usable output signal pulse in response to the generation of a predetermined amount of input signal such that when said predetermined amount of input signal is exceeded the electrometer is recycled to an initial condition comprising in combination:
a signal generator for generating said signal in response to a measured condition;
an integrating operational amplifier having high input impedance, said operational amplifier having an input circuit and an output circuit, said signal being applied to said input circuit, said integrator having an initial zero condition and providing an output signal having a level proportional to the summation of the applied input signal;
a feedback circuit operationally connected between said integrating operational amplifier input and output circuits, said feedback circuit including a first capacitor connected across said integrating operational amplifier input and output circuits;
a comparator operational amplifier biased in a comparator mode and having an input circuit, the output signal from said integrating operational amplifier being applied to said input of said comparator operational amplifier, said comparator operational amplifier providing a comparator output signal when the said integrating operational amplifier output signal exceeds a predetermined level;
feedback circuitry operationally connected with said comparator operational amplifier to insure positive switching of said comparator operational amplifier;
a second capacitor connected in said comparator feedback circuit to provide an AC coupling for positive feedback thereby providing a snap-on and snap-off condition for said comparator operational amplifier;
means responsive to said comparator output signal to generate the usable output signal pulse; and
a coil operated magnetic reed relay operationally connected across the first capacitor, said reed relay being normally in the open condition, said coil being responsive to the usable output signal pulse such that when said coil is engaged the reed relay is closed thereby discharging said first capacitor thereby resetting said integrator to the initial zero condition.

3,867,696
AN IMPROVED ELECTRICAL CURRENT MEASURING METER HAVING INTEGRAL CALIBRATION AND ZERO ADJUSTMENT MEANS
Eugene B. Raymond, 4041 Grove St., Skokie, Ill. 60076
Filed Jan. 4, 1974, Ser. No. 430,794
Int. Cl. G01r *1/04, 5/16*
U.S. Cl. 324—146 **13 Claims**

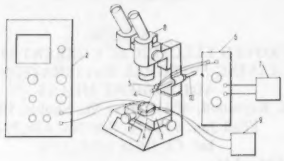


1. A meter for measuring electrical current in a circuit, comprising:
case means, having front and back sides and a visible front face for placing indicia defining a measuring scale, a shaft secured to the case means and extending toward the front thereof for supporting a pointer means, and a generally circularly shaped opening in the back located rearwardly of the shaft;
pointer means having a central portion with an aperture therein for receiving said shaft, an elongated pointer extending downwardly from the central portion, a counterweight portion opposite said pointer, and a first ferromagnetic member attached to the central portion, said pointer means being balanced and rotatable around said shaft;
an electrical current conductive member attached to the housing and having an elongated portion extending adjacent said pointer means for influencing the same in response to current flowing through the conductive member;
calibrating and zero adjustment means comprising a holder having a second ferromagnetic member secured thereto, said holder having a resilient outer periphery for frictionally engaging an inner surface of said opening of said case means, said calibrating and zero adjustment means being rotatable and spacially adjustable relative to said pointer means and said elongated portion of said current conductive means for enabling calibrating and adjustment of said meter.

3,867,697
MEASURING MEANS

Riccardo Vanzetti, Walpole, and Ashod S. Dostoomian, Stoughton, both of Mass., assignors to Vanzetti Infrared & Computer Systems, Inc., Dedham, Mass.

Continuation of Ser. No. 847,820, July 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 796,804, Feb. 5, 1969, abandoned. This application Aug. 20, 1971, Ser. No. 173,518
Int. Cl. G01r *31/26*
U.S. Cl. 324—158 D 7 Claims

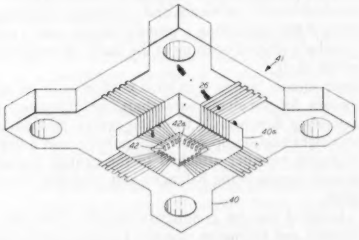


1. A non-contact, non-destructive method of monitoring a functioning, operating semi-conductor junction in an electric circuit with known voltage and current values, comprising the steps of capturing the recombination infra-red electromagnetic energy emitted by said junction in an optical fiber means that is of such size that less than 100 percent of the junction being viewed is monitored to enable the detection of radiation emitted at different points along the semiconductor junction and that negligibly attenuates electromagnetic energy at the infra-red wave lengths, conducting said infra-red energy through said optical fiber means to an infra-red transducer, transducing said infra-red energy into an electrical signal, and processing said electrical signal to monitor the operating characteristic of said junction.

3,867,698
TEST PROBE FOR INTEGRATED CIRCUIT CHIPS

Richard K. Beltz, Hamburg, and Jerry C. Hurst, Reading, both of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 337,043, March 1, 1973, Pat. No. 3,810,016. This application Jan. 31, 1974, Ser. No. 438,318
Int. Cl. G01r *1/06, 31/02*
U.S. Cl. 324—158 P 6 Claims

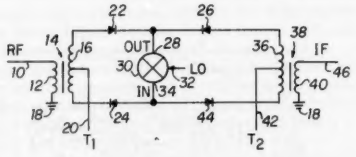


1. In an electrical test probe comprising:
an annular frame of thermoplastic material, said frame having opposing surfaces generally parallel to the plane defined by said frame, and
groups of electrical leads extending from the outer edge of said frame toward the inner edge along only one of said opposing surfaces, and having tip ends projecting in cantilevered fashion into the open center of the frame, each said projecting lead end having a bend therein such that the portion closest to the tip end of each lead is inclined away from said plastic frame,
different ones of said lead groups being disposed around the periphery of said frame at approximately integral multiples of ninety degrees from each other, and
segments of all said leads being embedded in the one surface such that the embedded portions of the segments are contiguous with and retained by the thermoplastic material at and adjacent to said one surface, the improvement being that:
the tip ends of the leads collectively form a pyramidal protrusion from said one surface, said protrusion having been formed by bending and concomitant lengthwise displacement of said leads prior to said lead embedding so that said tip ends forming said pyramidal protrusion are longer than if said protrusion had been formed by bending of said cantilevered leads after said lead embedding.

3,867,699
TRANSCEIVER SWITCHING CIRCUIT

C. Daniel Stoffer, Markham, Ontario, Canada, assignor to Rockwell International Corporation, Dallas, Tex.

Filed Dec. 14, 1973, Ser. No. 424,600
Int. Cl. H04b *1/44*
U.S. Cl. 325—18 2 Claims

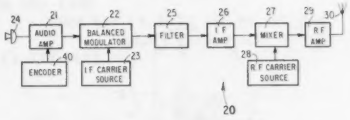


1. A transceiver switch for use with a single unidirectional mixer for both transmission and reception comprising, in combination:
RF transformer means including a first winding and a center tapped second winding;
IF transformer means including a first winding and a center tapped second winding;
first logic means comprising first and second diodes connected to a first common terminal means whereby current flow through either of said diodes goes out said first common terminal;
second logic means comprising third and fourth diodes connected to a second common terminal means whereby current flow through either of said third and fourth diodes is from said second common terminal means;
means for connecting said first and second diodes respectively of said first logic means to first ends of said second windings of said RF and IF transformers, respectively;
means for connecting said third and fourth diodes respectively of said second logic means to the other ends of said second windings of said RF and IF transformers respectively;
means for connecting said first and second common terminal means to a unidirectional mixer;
means for connecting said first winding of said RF transformer to RF signal circuitry;
means for connecting said first winding of said IF transformer to IF signal circuitry; and
means connected between the center taps of said second windings of said IF and RF transformers for supplying current therebetween in one direction for receiving signals and in the other direction for transmitting signals.

3,867,700
TONE OPERATED SINGLE SIDE-BAND COMMUNICATION SYSTEM

Keith H. Wycoff, P.O. Box 308, Lexington, Nebr. 68850

Division of Ser. No. 306,859, Nov. 15, 1972, Pat. No. 3,828,272. This application Nov. 21, 1973, Ser. No. 417,817
Int. Cl. H04b *1/68;* **H04q** *7/02*
U.S. Cl. 325—50 **11 Claims**



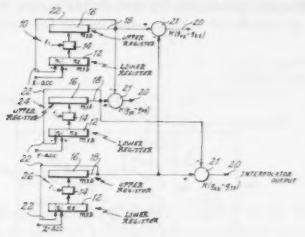
1. A communication receiver for receiving incoming single side-band signals modulated by two simultaneous tones lasting for a predetermined duration and by a subsequent intelligence message, said receiver comprising processing means for receiving the incoming signals and providing an IF signal including single side-band components corresponding to the two simultaneous tones and to the intelligence message, circuit means including an IF carrier source and product detector means coupled to said IF carrier source and to said processing means and being operative to detect the IF signal and thereby provide the intelligence message, an audio circuit coupled to said product detector and including transducer means for converting the intelligence message, AM detector means coupled to said processing means for mixing the single side-band components in the IF signal to provide a difference frequency signal having a frequency equal to the difference in frequency between the tones, a tuned circuit coupled to said AM detector means for providing an output signal when the difference frequency signal has a predetermined frequency, electronic switching means coupled to said tuned circuit and responsive to the output signal for providing an enabling signal which extends beyond termination of the tones, first means coupled to said switching means for rendering said audio circuit operative to furnish an output in accordance with the intelligence message in the presence of the enabling signal and for rendering said audio circuit inoperative in the absence of said enabling signal, and second means coupled to said switching means for rendering said circuit means operative and said AM detector means inoperative in the presence of the enabling signal and for rendering said circuit means inoperative and said AM detector means operative in the absence of the enabling signal.

3,867,701
METHOD OF CHANGING A PHASE DIFFERENCE IN AN INPUT PULSE TO A PULSE RATE

Paul R. Karmel, Hastings-on-Hudson, N.Y.; William E. Toth, Bolton, and Milton B. Trageser, Winchester, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 27, 1968, Ser. No. 763,420
Int. Cl. H03k *5/20, 9/06*
U.S. Cl. 328—134 **2 Claims**

1. A method of changing a phase difference in an input pulse to a pulse rate in the output comprising feeding periodically spaced pulses into the lower register of a digital differential analyser at a value which is obtained by adding the pulses at some level greater than the least significant bit of the register, accumulating a number of pulses in the lower register, periodically, at a significantly higher frequency than the frequency of the input pulse train, adding the contents of the lower register to the contents of the upper register of the digital differential analyser, when the contents of the upper register exceeds a predetermined value, simultaneously, subtracting this value from the upper register and generating an overflow pulse, and utilizing this overflow pulse both as an output to be compared with a predetermined reference and as

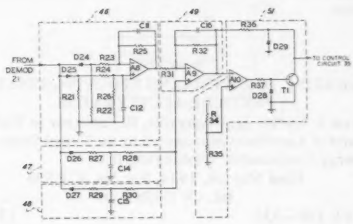


a pulse to be fed back into a least significant bit of the lower register with a reversed sign.

3,867,702
DISTORTION MEASURING APPARATUS

John D. Torpie, Penfield; Allan J. Bell, Fairport; Michael L. Gorham, Rochester, and Walter G. Keating, Baldwinsville, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 214,146, Dec. 30, 1971, Pat. No. 3,798,576. This application June 28, 1973, Ser. No. 374,703
Int. Cl. H04b *15/00*
U.S. Cl. 328—163 **6 Claims**



1. Apparatus for measuring the amount of distortion introduced to a rectangular wave pulse by a transmission medium and providing a signal at an output terminal thereof representative of said distortion, said apparatus comprising

means for measuring the positive peak value of the distorted pulse;

means for measuring the negative peak value of the distorted pulse;

means for measuring the DC average valve of the distorted pulse, and

means for summing the positive and the negative peak values and the DC average values to provide an output signal at said output terminal representing a measure of the delay distortion caused by the transmission medium.

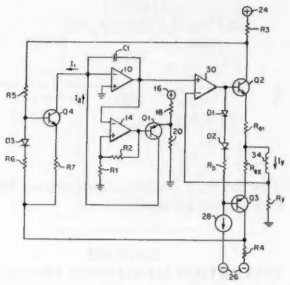
3,867,703
SWEEP GENERATOR FOR LINEAR CATHODE RAY TUBE DISPLAY

George A. Cavigelli, Lexington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 6, 1973, Ser. No. 386,237
Int. Cl. H03k *4/10;* **H01j** *29/70*
U.S. Cl. 328—184 **14 Claims**

1. A sweep current generator comprising a source of current, integrating means responsive to said source current for developing a voltage which changes smoothly and continuously from a first level to a second level as a function of said source current, driver means for generating a sweep current which is a function of the voltage developed by said integrat-

ing means, switching means for resetting the voltage developed by said integrating means to said first level responsive to said voltage reaching said second level, means for sensing the sweep current generated by said driver means to develop a voltage proportional thereto, and means for controlling said



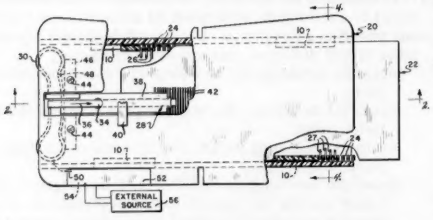
source of current to be constant until the absolute magnitude of the sweep current generated by said driver means exceeds a predetermined value and thereafter for controlling said source of current to change in a direction which causes the voltage developed by said integrating means to be exponential in form.

3,867,704

MAGAZINE FOR HANDLING STRIPPING FOILS IN A PARTICLE ACCELERATOR

Andrew J. Gorka, Jr., Naperville, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,550
Int. Cl. H05h *7/00*
U.S. Cl. 328—233 **12 Claims**



1. A foil assembly for insertion into a beam of charged particles to effect charge exchange in said beam, said foil assembly comprising:

a foil formed of a thin film of an organic polymer, said foil having an area greater than the cross-sectional area of said beam;

a first rod connected to said foil at a first edge thereof, said first rod being longer than said first edge and projecting beyond said foil at each end of said first edge to form a pair of first supporting projections; and

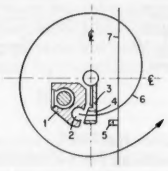
a second rod connected to said foil at a second edge thereof opposite to said first edge, said second rod being longer than said second edge and projecting beyond said foil at each end of said second edge to form a pair of second supporting projections.

3,867,705

CYCLOTRON INTERNAL ION SOURCE WITH DC EXTRACTION

Ed D. Hudson, Knoxville; Richard S. Lord, and Merrit L. Mallory, both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,392
Int. Cl. H05h *7/08, 13/00*
U.S. Cl. 328—234 **2 Claims**



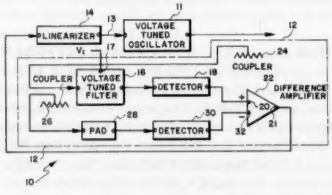
1. In an isochronous cyclotron provided with a magnetic field, an internal ion source provided with an arc chamber, a variable radio-frequency (rf) system including an rf accelerating slit for withdrawing ions from said arc chamber, said rf system effecting the acceleration of said ions through said cyclotron as guided by said magnetic field, and an ion beam extraction system for extracting a desired separated ion beam from said cyclotron, the improvement comprising a slotted dc accelerating electrode positioned between the exist of said ion source arc chamber and said rf accelerating slit, and a source of substantially large negative voltage connected to said dc accelerating electrode, whereby, during operation of said cyclotron, heavy ion beams being accelerated in said cyclotron on harmonics from the **5th** to the **11th** harmonic have their beam intensities increased from nanoamperes to microamperes by use of said dc accelerating electrode in said cyclotron.

3,867,706

FREQUENCY CONTROL AND STABILIZATION MEANS AND FREQUENCY DISCRIMINATOR

Paul E. Gili, Brookline, N.H., assignor to Frequency Sources, Inc., North Chelmsford, Mass.

Filed Nov. 8, 1973, Ser. No. 413,916
Int. Cl. H03b *3/04;* **H03d** *3/00*
U.S. Cl. 329—112 **10 Claims**



1. A frequency control and stabilization system comprising:

a. a tunable signal supply means for supplying a first signal at a frequency and at a power output level;

b. frequency filter means adjusted to said frequency and responsive to the frequency and power output level of said signal supply means for generating a first comparison signal having a magnitude that is a function of the frequency and power output level of said first signal;

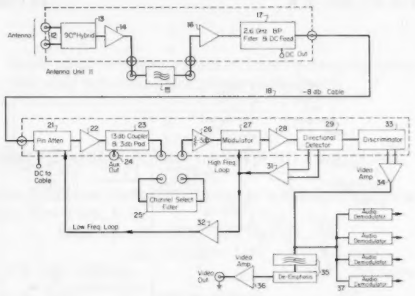
c. means responsive to the power output level of said first signal for generating a second comparison signal having a magnitude which is a function of the said power output level; and

d. circuit means for subtracting said comparison signals for developing a tuning signal, said tuning signal being coupled to said signal supply means for tuning said signal supply means to said frequency.

3,867,707
CONTROLLED SIGNAL RECEIVER

Richard D. Pering, Palo Alto, and James A. Hall, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 19, 1973, Ser. No. 352,806
Int. Cl. H03d *3/00*
U.S. Cl. 329—132 **1 Claim**



1. A signal translating apparatus for suppressing amplitude variations appearing on an applied high frequency signal, the apparatus comprising:

first and second means, each having a pair of inputs and an output for producing at the output thereof a signal which is representative of the combination of signals applied to the inputs thereof;

means for coupling the output of the first means to one input of the second means;

detector means for producing an output signal representative of amplitude variations of a high frequency signal applied thereto;

means coupling the output of said second means to said detector means for applying a high frequency signal thereto from said second means;

first circuit means for applying said output signal from said detector means to another input of the second means;

second circuit means for applying said output signal from said detector means to one input of said first means, said second circuit means having a longer time constant than said first circuit means; and

means coupled to another input of said first means for applying thereto a high frequency signal having amplitude variations which are to be suppressed.

3,867,708
TRANSMISSION SYSTEM WITH CABLE FOR TRANSMISSION OF HIGH FREQUENCY SIGNALS

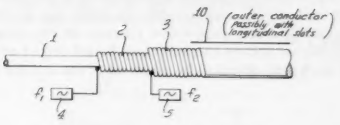
Klaus Bretting, Heroldsberg, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Oct. 4, 1973, Ser. No. 403,634
Int. Cl. H03f *7/02*
U.S. Cl. 330—4.6 **3 Claims**

1. In a signal transmission system with a transmitter for an information signal at a first frequency and a cable for transmitting the information signal, the improvement comprising:

a magnetic core having magnetic permeability which exhibits a step; a first signal conductor wound on said core and connected to said transmitter; a second conductor wound also on said core; and

a source for a control signal connected to said second conductor for magnetically biasing and controlling the core and having a d.c. biasing component and a variable component of a second frequency having amplitude and being

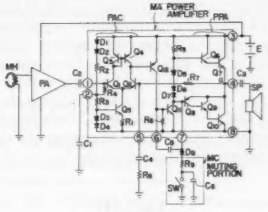


adjusted in phase and frequency relative to the first frequency, so that the effective permeability of the core in any point thereof is reduced upon occurrence of an information signal peak and increased upon occurrence of information signal zero crossings.

3,867,709
MUTING SYSTEM FOR POWER AMPLIFIER

Kunio Seki, and Ryozo Kontani, both of Tokyo, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Oct. 4, 1973, Ser. No. 403,407
Claims priority, application Japan, Oct. 4, 1972, 47-99006
Int. Cl. H03f *3/26*
U.S. Cl. 330—15 **8 Claims**



1. A power amplifier comprising a pre-amplifier portion connected to an amplifier portion having a push-pull amplifier configuration and a voltage gain of substantially unity, a D.C. feedback path connecting the mid-point output of the push-pull amplifier portion to said pre-amplifier portion, and muting means connected to the push-pull amplifier portion for controlling the mid-point output potential of said push-pull amplifier portion to block input signals in said pre-amplifier portion via said D.C. feedback path.

3,867,710
COMMUNICATION SYSTEM

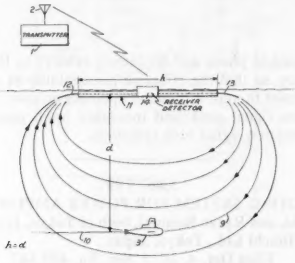
Henri G. Busignies, Montclair, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 2, 1960, Ser. No. 26,232
Int. Cl. H04b *13/02*; **H01q** *1/04*
U.S. Cl. 340—4 R **16 Claims**

1. A system for communicating electromagnetic signals between the atmosphere and an underwater object, comprising insulated conductive means carried by said object and releasable by said object to be disposed at the surface of the water adapted to detect said signals, said conductive means being disposed separate from and in the vicinity of said object and having uninsulated ends thereof in contact with said water, said received signals being radiated into said water from said ends and producing conduction currents and corresponding electromagnetic fields in the water surrounding said object.

7. A system for communicating electromagnetic signals through the atmosphere between at least two underwater

objects capable of transmitting and receiving electromagnetic signals comprising a transmitter and receiver for said signals carried by each of said objects, first conductive means carried by each said object and disposed within the water for radiating said transmitted signals into the water and producing conductive currents and corresponding fields in the water surrounding said object and capable of receiving incoming signals carried by other conductive currents in the vicinity, second conductive means carried by each said object and releasable by each said object to be disposed at the surface of the water



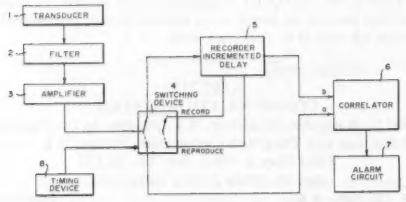
separate from said object and in the vicinity of each of said objects with the ends thereof in contact with the water and capable of receiving the transmitted signals of said conductive currents and to radiate said transmitted signals into the atmosphere for reception by the second conductive means disposed on the surface of the water separate from and in the vicinity of the other object, said second conductive means being capable of detecting said signals radiated through the atmosphere and radiating said signals through said ends into the water and producing conduction currents and corresponding fields in the water surrounding the adjacent object.

3,867,711

SWIMMER DETECTION SYSTEM FOR REMOTE OR LOCAL DEPLOYMENT

Paul V. Ruscus, 5601 Nebraska Ave., N.W., Washington, D.C. 20015

Filed June 25, 1973, Ser. No. 377,171
Int. Cl. G08b *13/00*
U.S. Cl. 340—5 R **7 Claims**



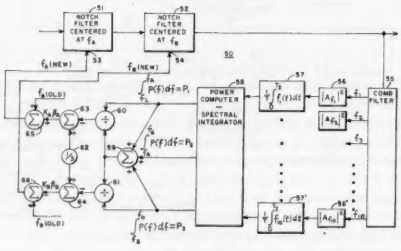
6. A method for detecting a swimmer comprising:
receiving a remotely produced acoustic signal;
recording a sample of said received signal on a recorder;
correlating the recorded sample signal with an acoustic signal received successively to said recorded sample signal;
comparing the correlated signal with a predetermined threshold level, the magnitude of said level indicating the presence of a swimmer;
incrementally delaying said recorded sample signal in the absence of a correlated signal level above said predetermined threshold;
recorrelating the incrementally delayed recorded sample with successively received acoustic signals until the correlated signal level exceeds said threshold level; and
erasing said recorded sample if said correlated signal level has a magnitude less than said predetermined threshold level.

3,867,712

ADAPTIVE FILTER

William P. Harthill, and Henry Van Calcar, both of Seattle, Wash., assignors to Honeywell Inc., Minneapolis, Ind.

Filed June 28, 1972, Ser. No. 266,906
Int. Cl. G01v *1/00*
U.S. Cl. 340—6 R **13 Claims**



1. A filter for blocking signal components within a frequency band having independently variable band width and center frequency comprising:
first and second notch filters, each having a center frequency which is variable in response to a frequency control signal;
means for connecting said first and second notch filters in series;
means for supplying an incoming signal having frequency components between lower and upper frequency limits to said first notch filter;
computing means for accepting an input signal and determining first and second frequencies such that the powers represented by portions of the input signal in frequency bands lying between pairs of the lower frequency limit, the first frequency, the second frequency and the upper frequency limit are related in accordance with predetermined criteria;
means for supplying the output signal of said second notch filter to said computing means as the input signal; and
means for supplying signals indicative of the first and second frequencies respectively as the frequency control signals of the said first and second notch filters.

3,867,713

MULTIFOLD SEISMIC EXPLORATION OVER PURPOSEFULLY CROOKED TRAVERSES

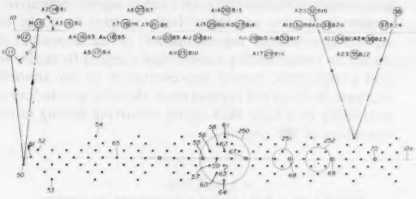
Edward R. Tegland, Dallas, Tex., and Howard L. Viger, Metairie, La., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 22, 1973, Ser. No. 372,712
Int. Cl. G01v *1/13, 1/20, 1/38*
U.S. Cl. 340—15.5 CP **8 Claims**

1. In seismic exploration where seismic impulses are generated successively, one impulse at each of a plurality of locations spaced along purposefully crooked traverse and where seismic waves resulting from each said impulse are detected

along said traverse, the method which comprises:

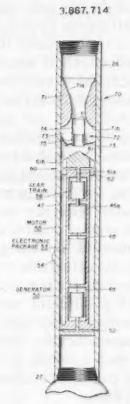
stacking all the detected signals which have a common depth point to produce stacked traces portraying multifold areal subsurface structural conditions.



3,867,714
TORQUE ASSIST FOR LOGGING-WHILE-DRILLING TOOL

Bobbie Joe Patton, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,705
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 LD **5 Claims**



1. A logging-while-drilling apparatus for use in an earth drilling operation comprising:

a conduit adapted to be connected into a drill string of an earth drilling apparatus;

a logging-while-drilling tool positioned within said conduit, said tool having a turbinelike, signal generating valve positioned so that at least a portion of any drilling fluid flowing through said conduit will flow through said valve; and means in said conduit upstream of said valve for conditioning said drilling fluid comprising:

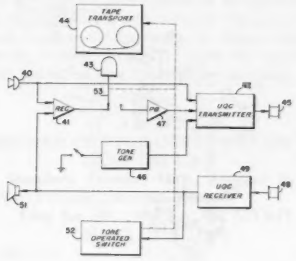
a jet positioned in said conduit so that said drilling fluid will pass therethrough; and

a means positioned in said conduit below said jet for imparting angular motion to at least a portion of said drilling fluid after it exits said jet and before it passes through said valve means.

3,867,715
UNDERWATER COMMUNICATIONS SYSTEM

Fred G. Geil, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1973, Ser. No. 414,012
Int. Cl. H04b *1/62, 11/00*
U.S. Cl. 340—5 T **10 Claims**



1. A method of voice communication in a reverberant environment comprising the steps of:

transmitting the voice communication over a normal communication path from a first station to a second station spaced therefrom in said reverberant environment where it is received;

simultaneously recording at a first rate the voice communication during the transmitting step at the first station;

replaying the recorded voice communication in reverse time sequence and at a slower rate than that at which it was recorded;

transmitting the replayed voice communication over the normal communication path between said first and said second stations;

rerecording said replayed voice communication at said slower rate of speed at said second station as it is received over said communication path;

replaying said rerecorded voice communication at the said first rate and in reverse time sequence than that at which it was rerecorded at said second station; and

utilizing said received voice communications to extract information therefrom.

3,867,716
RELATIVE MOVEMENT SYSTEM HAVING ALARM MEANS

Paul B. King, Mountain Lakes, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed May 22, 1973, Ser. No. 362,729
Int. Cl. G05d *1/04;* **G01j** *1/36*
U.S. Cl. 340—27 R **8 Claims**

1. In an apparatus for sensing relative movement between a pair of bodies, said apparatus having

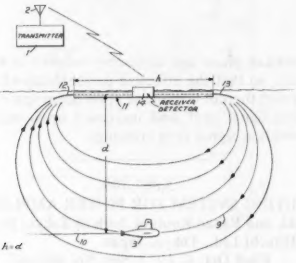
a pair of photosensitive elements,

means for directing a primary beam of light onto both of said photosensitive elements, said primary beam having a null position where the quantities of light striking said photosensitive elements are balanced in a given ratio, means for moving the primary beam through small excursions in response to relative movement between said bodies to change the ratio of light striking the photosensitive elements,

restorative means responsive to signals from the photosensitive elements for moving the bodies to reestablish the balanced condition where the quantities of light striking the photosensitive element are in said given ratio,

an improvement comprising an alarm means for indicating malfunction of the apparatus,

objects capable of transmitting and receiving electromagnetic signals comprising a transmitter and receiver for said signals carried by each of said objects, first conductive means carried by each said object and disposed within the water for radiating said transmitted signals into the water and producing conductive currents and corresponding fields in the water surrounding said object and capable of receiving incoming signals carried by other conductive currents in the vicinity, second conductive means carried by each said object and releasable by each said object to be disposed at the surface of the water



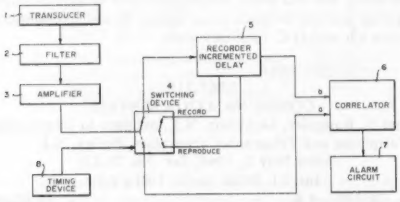
separate from said object and in the vicinity of each of said objects with the ends thereof in contact with the water and capable of receiving the transmitted signals of said conductive currents and to radiate said transmitted signals into the atmosphere for reception by the second conductive means disposed on the surface of the water separate from and in the vicinity of the other object, said second conductive means being capable of detecting said signals radiated through the atmosphere and radiating said signals through said ends into the water and producing conduction currents and corresponding fields in the water surrounding the adjacent object.

3,867,711

SWIMMER DETECTION SYSTEM FOR REMOTE OR LOCAL DEPLOYMENT

Paul V. Ruscus, 5601 Nebraska Ave., N.W., Washington, D.C. 20015

Filed June 25, 1973, Ser. No. 377,171
Int. Cl. G08b *13/00*
U.S. Cl. 340—5 R **7 Claims**



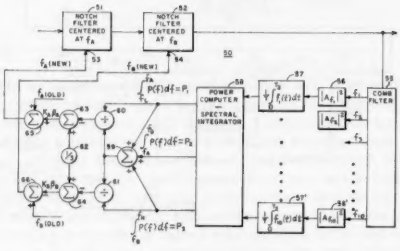
6. A method for detecting a swimmer comprising:
receiving a remotely produced acoustic signal;
recording a sample of said received signal on a recorder;
correlating the recorded sample signal with an acoustic signal received successively to said recorded sample signal;
comparing the correlated signal with a predetermined threshold level, the magnitude of said level indicating the presence of a swimmer;
incrementally delaying said recorded sample signal in the absence of a correlated signal level above said predetermined threshold;
recorrelating the incrementally delayed recorded sample with successively received acoustic signals until the correlated signal level exceeds said threshold level; and
erasing said recorded sample if said correlated signal level has a magnitude less than said predetermined threshold level.

3,867,712

ADAPTIVE FILTER

William P. Harthill, and Henry Van Calcar, both of Seattle, Wash., assignors to Honeywell Inc., Minneapolis, Ind.

Filed June 28, 1972, Ser. No. 266,906
Int. Cl. G01v *1/00*
U.S. Cl. 340—6 R **13 Claims**



1. A filter for blocking signal components within a frequency band having independently variable band width and center frequency comprising:
first and second notch filters, each having a center frequency which is variable in response to a frequency control signal;
means for connecting said first and second notch filters in series;
means for supplying an incoming signal having frequency components between lower and upper frequency limits to said first notch filter;
computing means for accepting an input signal and determining first and second frequencies such that the powers represented by portions of the input signal in frequency bands lying between pairs of the lower frequency limit, the first frequency, the second frequency and the upper frequency limit are related in accordance with predetermined criteria;
means for supplying the output signal of said second notch filter to said computing means as the input signal; and
means for supplying signals indicative of the first and second frequencies respectively as the frequency control signals of the said first and second notch filters.

3,867,713

MULTIFOLD SEISMIC EXPLORATION OVER PURPOSEFULLY CROOKED TRAVERSES

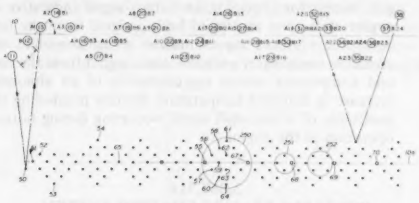
Edward R. Tegland, Dallas, Tex., and Howard L. Viger, Metairie, La., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 22, 1973, Ser. No. 372,712
Int. Cl. G01v *1/13, 1/20, 1/38*
U.S. Cl. 340—15.5 CP **8 Claims**

1. In seismic exploration where seismic impulses are generated successively, one impulse at each of a plurality of locations spaced along purposefully crooked traverse and where seismic waves resulting from each said impulse are detected

along said traverse, the method which comprises:

stacking all the detected signals which have a common



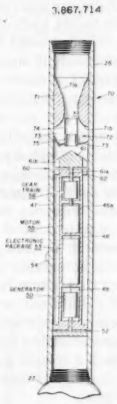
depth point to produce stacked traces portraying multifold areal subsurface structural conditions.

3,867,714

TORQUE ASSIST FOR LOGGING-WHILE-DRILLING TOOL

Bobbie Joe Patton, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,705
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 LD **5 Claims**



1. A logging-while-drilling apparatus for use in an earth drilling operation comprising:

a conduit adapted to be connected into a drill string of an earth drilling apparatus;

a logging-while-drilling tool positioned within said conduit, said tool having a turbinelike, signal generating valve positioned so that at least a portion of any drilling fluid flowing through said conduit will flow through said valve; and means in said conduit upstream of said valve for conditioning said drilling fluid comprising:

a jet positioned in said conduit so that said drilling fluid will pass therethrough; and

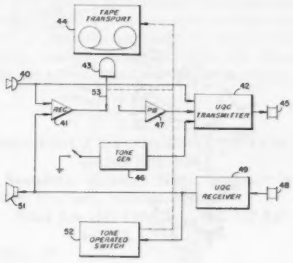
a means positioned in said conduit below said jet for imparting angular motion to at least a portion of said drilling fluid after it exits said jet and before it passes through said valve means.

3,867,715

UNDERWATER COMMUNICATIONS SYSTEM

Fred G. Geil, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1973, Ser. No. 414,012
Int. Cl. H04b *1/62, 11/00*
U.S. Cl. 340—5 T **10 Claims**



1. A method of voice communication in a reverberant environment comprising the steps of:

transmitting the voice communication over a normal communication path from a first station to a second station spaced therefrom in said reverberant environment where it is received;

simultaneously recording at a first rate the voice communication during the transmitting step at the first station;

replaying the recorded voice communication in reverse time sequence and at a slower rate than that at which it was recorded;

transmitting the replayed voice communication over the normal communication path between said first and said second stations;

rerecording said replayed voice communication at said slower rate of speed at said second station as it is received over said communication path;

replaying said rerecorded voice communication at the said first rate and in reverse time sequence than that at which it was rerecorded at said second station; and

utilizing said received voice communications to extract information therefrom.

3,867,716

RELATIVE MOVEMENT SYSTEM HAVING ALARM MEANS

Paul B. King, Mountain Lakes, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed May 22, 1973, Ser. No. 362,729
Int. Cl. G05d *1/04;* **G01j** *1/36*
U.S. Cl. 340—27 R **8 Claims**

1. In an apparatus for sensing relative movement between a pair of bodies, said apparatus having

a pair of photosensitive elements,

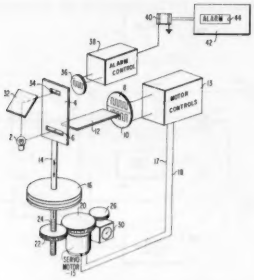
means for directing a primary beam of light onto both of said photosensitive elements, said primary beam having a null position where the quantities of light striking said photosensitive elements are balanced in a given ratio, means for moving the primary beam through small excursions in response to relative movement between said bodies to change the ratio of light striking the photosensitive elements,

restorative means responsive to signals from the photosensitive elements for moving the bodies to reestablish the balanced condition where the quantities of light striking the photosensitive element are in said given ratio,

an improvement comprising an alarm means for indicating malfunction of the apparatus,

said alarm means including a malfunction signalling means having a normal operational condition and a malfunction-indicating condition, and

alarm actuating means for shifting the alarm means to its malfunction-indicating condition in response to displacement of the primary beam beyond a predetermined limit of said small excursions, said alarm actuating means



includes a circuit having an alarm-actuating photosensitive element,

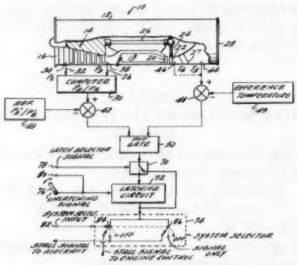
means for directing a secondary beam of light on the alarm-actuating photosensitive element only when the primary beam of light is at a distance less than said predetermined limit of said small excursions from its null position, said means for moving the primary beam also moving the secondary beam.

3,867,717

STALL WARNING SYSTEM FOR A GAS TURBINE ENGINE

John Theodore Moehring, and Virgil Willis Lawson, both of Cincinnati, Ohio, assignors to General Electric Company, Lynn, Mass.

Filed Apr. 25, 1973, Ser. No. 354,303
Int. Cl. G01m *15/00*
U.S. Cl. 340—27 SS **23 Claims**



1. A stall warning system for a gas turbine engine of the type having a compressor, combustor, turbine and exhaust duct in serial flow relation comprises:

means for detecting pressure in at least one location along the compressor inlet and outlet flowpaths thus providing a signal indicative of the detected pressure;

first comparator means for receiving the detected compressor pressure signal and comparing the detected signal with a reference signal to provide an output signal representative of an abnormal decrease in compressor pressure;

means for detecting a temperature representative of turbine temperature thus providing a signal indicative of the detected temperature;

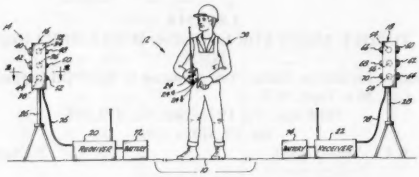
second comparator means for receiving the detected temperature signal and comparing the detected signal with a reference signal to provide an output signal representative of an abnormal increase in turbine temperature; and gate means for providing an output signal indicative of engine stall upon receipt of both a signal from the first comparator means representative of an abnormal decrease in compressor pressure and a signal from the second comparator means representative of an abnormal increase in detected temperature thereby precluding the possibility of a false stall signal occurring during normal operation of the engine.

3,867,718

PORTABLE TRAFFIC CONTROL SYSTEM

Stephen S. Moe, P.O. Box 595, Springfield, Oreg. 97477

Filed May 30, 1972, Ser. No. 257,797
Int. Cl. G08g *1/07*
U.S. Cl. 340—31 R **4 Claims**



1. A portable traffic control system comprising

a pair of portable signal-display units adapted to be placed for use at spaced-apart points, each of said units including a signal-display element observable from one side of the unit and placeable selectively in signaling and nonsignaling states and means enabling monitoring of the states of said element simultaneously from the opposite side of the unit, and

signal-display actuating means including a portable remote control device operatively coupled to each of said signal-display elements of said units, said signal-display actuating means employing radio-frequency communication and comprising a radio-frequency receiver for each signal-display unit, said remote control device comprising a radio-frequency transmitter including a pair of independently actuatable means actuatable to effect communication by said transmitter from a remote location selectively and exclusively with a different one of said receivers independently of communication with the other receiver, such independent communication capability enabling the establishment from such a remote location of a plurality of different selected traffic movement conditions in the region between said units.

3,867,719

RELATIVE MOVEMENT RESPONSIVE SIREN ALERT

John W. Perrin, 3805 Harness Ln., Camp Hill, Pa. 17011

Filed Mar. 24, 1972, Ser. No. 237,642
Int. Cl. G08g *1/09*
U.S. Cl. 340—33 **8 Claims**

1. A relative movement responsive siren alert for use with a surface vehicle and comprising:

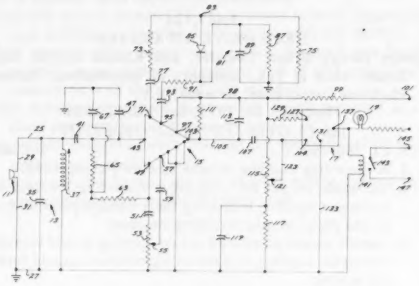
transducer means for mounting exteriorly of said vehicle and operative in response to an audio signal from a siren to produce an electrical signal;

amplifier means connected with said transducer means including demodulating means for amplifying and demodulating said electrical signal to produce an amplified demodulated signal;

frequency responsive means connected with said amplifier means and operative in response to frequency shift in one direction of said amplified signal to produce a first alert

signal and to frequency shift in the direction opposite said one direction to produce a second alert signal;

alarm means connected with said frequency responsive means and responsive to said first alert signal to produce a first alarm signal detectable by human senses and to said second alert signal to produce a second alarm signal detectable by human senses, whereby convergence of said siren and said vehicle will produce a first Doppler,



effect detectable to said transducer to cause a first frequency shift of said amplified signal in said one direction said first frequency shift being demodulated to actuate said alarm means to produce said first alarm signal while divergence of said vehicle and siren will produce a second Doppler effect to cause a second frequency shift of said amplified signal in said direction opposite said one direction said second frequency being demodulated to actuate said alarm means to produce said second alarm signal.

3,867,720

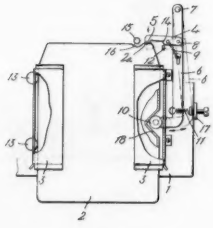
CARTRIDGE LOCKING DEVICE FOR TAPE PLAYERS

Yoshinobu Tanaka, No. 8-11, 2-chome, Kita-machi, Warabi-shi, Saitama-ken, Japan

Continuation-in-part of Ser. No. 93,260, Nov. 27, 1970, abandoned. This application May 21, 1973, Ser. No. 362,304

Int. Cl. G11b *5/56, 5/78*

U.S. Cl. 360—93 **3 Claims**



1. In a player, for magnetic tape cartridges, having a deck and means on said deck to define a tunnel to receive a cartridge slid longitudinally therein, the improvement which comprises in combination a first arm pivoted at one of its ends to said deck for lateral swinging movement, recess-engaging means mounted on the other end of said first arm and positioned for movement into a recess in a side of a cartridge inserted fully into said tunnel, spring-loading means secured to said deck and to said first arm to urge the first arm in the direction to move said recess-engaging means toward the cartridge, a second arm pivoted by one of its ends on said first arm, a shoulder on said second arm, a stop on said deck positioned to be contactable by said shoulder, spring-loading means secured to said first arm and to said second arm to urge said second arm into a position in which said shoulder is engaged by said stop, and abutment means on the other end of said second arm positioned to be contacted by the leading end of a cartridge inserted into and pushed towards fully inserted position in said tunnel, whereby during insertion of a cartridge into said tunnel said recess-engaging means is in a retracted condition and as the cartridge approaches a fully inserted position with its recess registering with the recess-engaging means, its leading end contacts said abutment means and shifts said second arm against its spring-loading means such that said shoulder is moved out of engagement with said stop means, to cause the first arm to be rotated about its pivot by its spring loading means to move the recess-engaging means into the recess in the side of the cartridge.

3,867,721

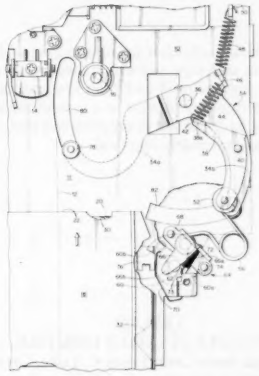
CARTRIDGE EJECT MECHANISM FOR TAPE PLAYERS AND THE LIKE

Allan L. Saunders, Melrose, Mass., assignor to Automatic Radio Mfg. Co., Inc., Melrose, Mass.

Filed Jan. 30, 1973, Ser. No. 327,947

Int. Cl. G11b *25/06*

U.S. Cl. 360—93 **10 Claims**



1. For use with a tape players and the like having a tunnel into which a tape cartridge is inserted, apparatus for exerting an ejecting force on the cartridge comprising: a link means connected to a cocking mechanism by a spring means, said link means being pivotally movable in one direction in response to insertion of a tape cartridge into the tunnel, the said pivotal movement in one direction being accompanied by an actuation of said cocking mechanism and a loading of said spring means, and trigger means for releasing said cocking mechanism in response to lateral movement of a tape cartridge in the tunnel, thereby allowing said spring means to unload with an accompanying pivotal movement of said link means in the opposite direction, which movement in the opposite direction causes said link means to exert an ejecting force on the tape cartridge.

3,867,722

CASSETTE EJECT MECHANISM

Keisuke Syohji, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corporation, Nogoya-shi, Japan

Filed June 12, 1973, Ser. No. 369,230

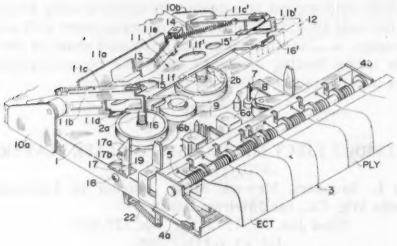
Claims priority, application Japan, Aug. 29, 1972, 47-101678

Int. Cl. G11b *15/00*

U.S. Cl. 360—96 **5 Claims**

1. In a magnetic recording reproducing device comprising a pair of reel spindles for removably mounting thereon a

magnetic tape cassette, drive means for rotating said spindles, magnetic head means for engaging a magnetic tape in said cassette, and a plurality of depressibly operated keys, including a playback key and an eject key, which are arranged in a row along one side of said device, the improvement comprising a cassette eject mechanism for disengaging said magnetic head means from said tape and simultaneously stopping said tape at one full depression of said eject key and for discharging said cassette from said device at a second full depression of said eject key, said one full depression and said second full depression being depressibly identical.



3,867,723

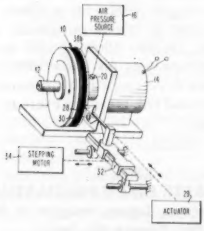
MULTIPLE FLEXIBLE DISK FILE

Robert J. Penfold, Santa Cruz; Frank E. Talke, Los Gatos, and Paul A. Thompson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1973, Ser. No. 414,614

Int. Cl. G11b *5/82, 25/04*

U.S. Cl. 360—98 **11 Claims**



1. In a storage apparatus having flexible magnetic disks mounted to a spindle assembly for rotation, the combination comprising:

discrete uniformly apertured spacers concentrically seated on said spindle assembly and disposed between adjacent disks; and

means for providing a flow of fluid outwardly from said spindle assembly and through said spacers, so that a uniform air flow is provided radially relative to said disks, wherein said spacers are of smaller diameter than said disks.

3,867,724

HEAD DRIVE APPARATUS

James Dudley Bruer, Leander, and Ronald Eugene Hunt, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,029

Int. Cl. G11b *17/02, 3/62;* **G01d** *15/28*

U.S. Cl. 360—97 **6 Claims**

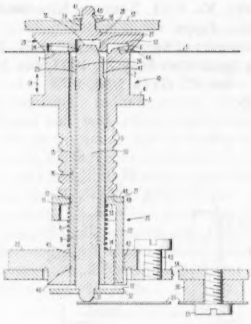
1. A recording medium spindle assembly comprising:

a. turntable means for carrying a recording medium and having an opening extending therethrough perpendicular to the plane of said recording medium;

b. spindle means positioned in said opening in said turntable means for aligning said recording medium on said turntable means;

c. support means for supporting said turntable means and biasing said turntable means toward said recording medium, said support means having an opening therein through which said spindle means extends;

d. aligning means positoned in said opening in said turntable means and said opening in said support means between said turntable means and said spindle means, and said support means and said spindle means for aligning said turntable means, said spindle means, and said support means;



e. translation means for causing said turntable means and said support means to be translated away from said recording medium, and permitting said turntable means and said support means to be translated toward said recording medium; and

f. means connected to said support means for causing said spindle means to be translated away from said recording medium after said turntable means, and permitting said spindle means to be translated toward and contact said recording medium before said turntable means.

3,867,725

ROTATING HEAD APPARATUS INCLUDING A THRUST GAS BEARING

Donovan M. Janssen, Boulder, Colo., and David Stedman, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,562

Int. Cl. G11b *5/52, 5/60*

U.S. Cl. 360—102 **4 Claims**

1. A rotating head apparatus, comprising:

first and second mandrel halves mounted in axial alignment and defining an annular cavity at the joint site thereof,

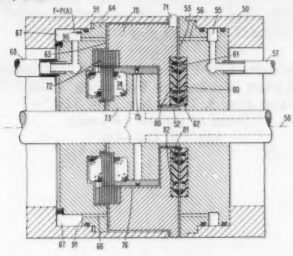
first annular rotary transformer means mounted at a fixed position in one radially extending wall of said cavity and concentric with the axis of said mandrel,

first annular hydrostatic gas bearing means mounted at a fixed position in said one cavity wall,

an axially movable piston forming the opposite axially extending wall of said cavity,

second annular hydrostatic gas bearing means carried by said piston in said opposite cavity wall,

a pressurized plenum movably supporting said piston and supplying gas under pressure to said second bearing means, and



an annular head wheel supported in said cavity by said gas bearing means and carrying second annular rotary transformer means on a surface thereof which confronts said first bearing means.

DESIGNS

FEBRUARY 18, 1975

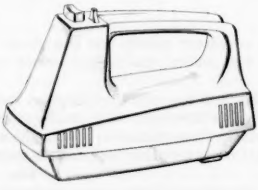
234,329
SEAT
Peter A. Rocchia, San Francisco, Calif., assignor to The Wicker Works, San Francisco, Calif.
Filed Jan. 3, 1973, Ser. No. 320,747
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

234,330
SEAT
Peter A. Rocchia, San Francisco, Calif., assignor to The Wicker Works, San Francisco, Calif.
Filed Jan. 3, 1973, Ser. No. 320,819
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

234,331
SEAT
Peter A. Rocchia, San Francisco, Calif., assignor to The Wicker Works, San Francisco, Calif.
Filed Jan. 8, 1973, Ser. No. 322,021
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

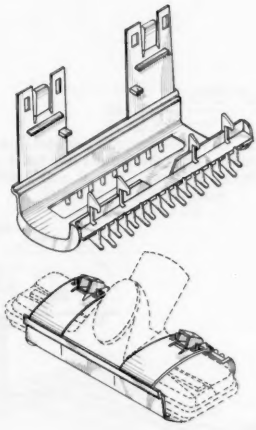
234,332
CHAIR
Satoshi Tada, Uenohara-machi, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,772
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

234,333
FOOD MIXER POWER UNIT
Jean Mantelet, Paris, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France
Filed June 1, 1972, Ser. No. 258,915
Claims priority, application France Dec. 3, 1971
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—158

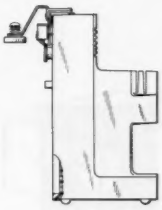


234,334
SUCTION CLEANER OR THE LIKE
Martin James Mims, London, England, assignor to The Hoover Company, North Canton, Ohio
Filed Aug. 6, 1973, Ser. No. 386,011
Claims priority, application Great Britain Mar. 1, 1973
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—165

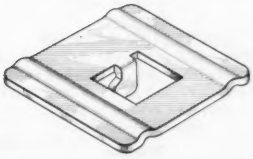
234,335
SHAG RAKE ATTACHMENT FOR VACUUM CLEANER NOZZLE
Edwin Fitzwater, Rahway, N.J., assignor to The General Signal Corporation, New York, N.Y.
Filed Aug. 31, 1972, Ser. No. 285,213
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—173



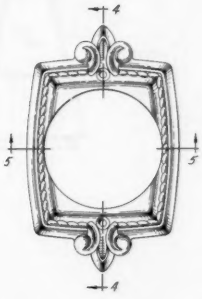
234,336
COMBINED CAN OPENER AND KNIFE SHARPENER
Melvin H. Boldt, Glenview, Ill., assignor to National Presto Industries, Inc., Eau Claire, Wis.
Filed Feb. 1, 1973, Ser. No. 328,521
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—35



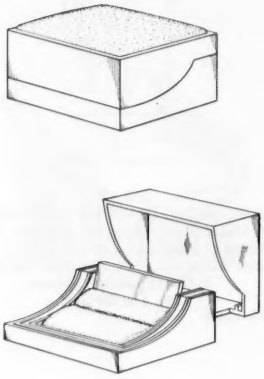
234,337
UNIVERSAL SHELF DIVIDER LOCKING DEVICE
Clarence F. Block, Barrington, Ill., assignor to Production Metal Products Co., Inc., Chicago, Ill.
Filed Oct. 16, 1973, Ser. No. 406,943
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—109



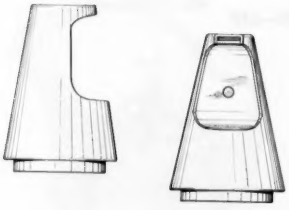
234,338
ESCUTCHEON FOR A DOOR KNOB AND THE LIKE
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Original design application Nov. 10, 1972, Ser. No. 305,567. Divided and this application Feb. 27, 1974, Ser. No. 446,471
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179



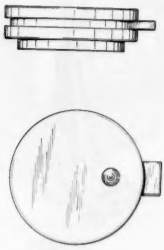
234,339
JEWELRY BOX
Jerome Shiffman, 128 Carthage Road, Scarsdale, N.Y. 10583
Filed Mar. 26, 1973, Ser. No. 344,550
Term of patent 7 years
Int. Cl. D9—*03*
U.S. Cl. D9—230



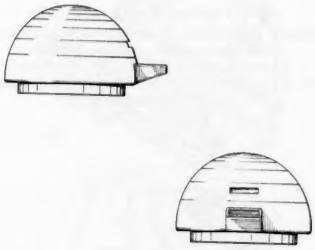
234,340
COMBINED DISPENSING CAP AND HEATER FOR A PRESSURIZED CONTAINER
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed July 20, 1973, Ser. No. 381,185
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



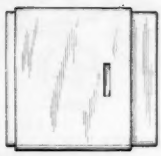
234,341
COMBINED DISPENSING CAP AND HEATER FOR A PRESSURIZED CONTAINER
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed July 20, 1973, Ser. No. 381,186
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



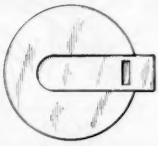
234,342
COMBINED DISPENSING CAP AND HEATER FOR A PRESSURIZED CONTAINER
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed July 20, 1973, Ser. No. 381,187
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



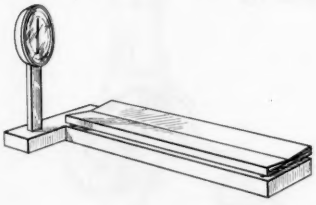
234,343
COMBINED DISPENSING CAP AND HEATER FOR A PRESSURIZED CONTAINER
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris, Plains, N.J.
Filed July 20, 1973, Ser. No. 381,188
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



234,344
COMBINED DISPENSING CAP AND HEATER FOR A PRESSURIZED CONTAINER
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed July 20, 1973, Ser. No. 381,189
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258

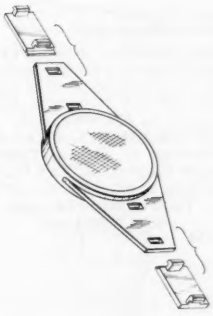


234,345
SCALE
James A. King, Sr., Greensboro, N.C., assignor to J. A. King and Company, Greensboro, N.C.
Filed Dec. 4, 1972, Ser. No. 311,454
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

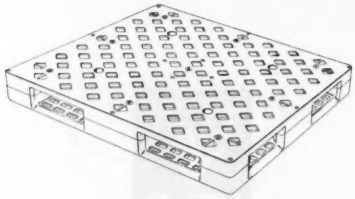


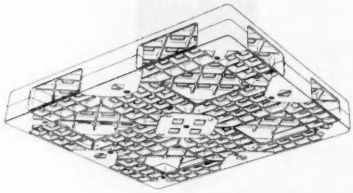
234,346
CHANGEABLE DISTRESS FLAG
Viktor Andersson, Stora Nygatan 2, S–211 37 Malmo, Sweden
Filed July 13, 1973, Ser. No. 378,960
Term of patent 7 years
Int. Cl. D29—*02*; D20—*03*
U.S. Cl. D10—109

234,347
BICYCLE REFLECTOR
Nicholas A. Amoroso, Hillsdale, N.J., assignor to Bright Star Industries, Inc., Clifton, N.J.
Filed Oct. 9, 1973, Ser. No. 404,707
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D10—111

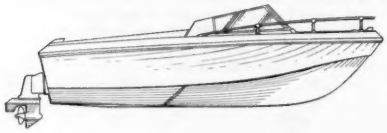


234,348
PALLET
John Edward Moses, St. Albans, England, assignor to John Dale Limited, London, England
Filed Nov. 21, 1973, Ser. No. 424,540
Claims priority, application Great Britain May 22, 1973
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53

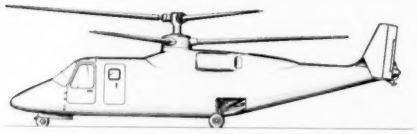




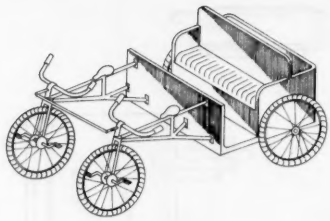
234,349
RUNABOUT POWER BOAT
Richard C. Cole, 19701 Whispering Pines Road, Miami, Fla. 33157
Filed Aug. 7, 1973, Ser. No. 386,299
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



234,350
HELICOPTER WITH COAXIAL ROTORS
Rudolph W. Beckert, Jr., Bethany, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Aug. 2, 1972, Ser. No. 277,204
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—74

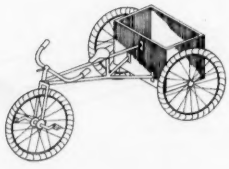


234,351
COMBINED VELOCIPEDE AND CARRIER
John A. Bingham, 84–A N. Lakeview Drive, Whispering Pines, N.C. 28389
Filed May 22, 1973, Ser. No. 362,790
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—107

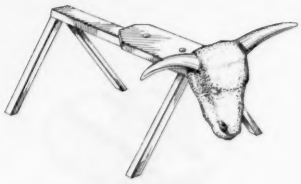


234,352
BICYCLE
Laurie J. Campbell and Calvin S. Cook, Erie, Pa., assignors to Louis Marx & Co. Inc., New York, N.Y.
Filed June 14, 1973, Ser. No. 370,101
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

234,353
COMBINED VELOCIPEDE AND CARRIER
John A. Bingham, 84–A N. Lakeview Drive, Whispering Pines, N.C. 28389
Filed May 22, 1973, Ser. No. 362,788
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112



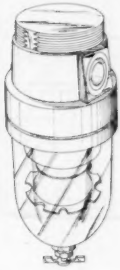
234,354
STEER ROPING TRAINER OR THE LIKE
Robert L. Kelton, 1895 Hayden Lane, Tempe, Ariz. 85281
Filed Aug. 13, 1973, Ser. No. 388,324
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



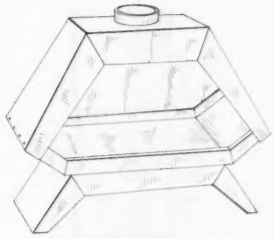
234,355
COMBINED FISHING POLE BALANCER AND PIVOT STAND THEREFOR
Robert H. West, 1720 Arvilla Drive, Sacramento, Calif. 95822
Filed Nov. 1, 1973, Ser. No. 411,782
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

234,356
COMBINED FILTER AND REGULATOR FOR PRESSURIZED FLUID
Clair Dean Holben and John Joseph Humphrey, Denver, Colo., assignors to C. A. Norgren Co., Littleton, Colo.
Filed July 17, 1972, Ser. No. 272,162
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

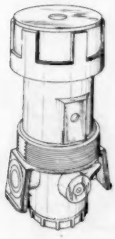
234,357
FILTER FOR PRESSURIZED FLUID
John Joseph Humphrey, Denver, Colo., assignor to C. A. Norgren Co., Littleton, Colo.
Filed July 17, 1972, Ser. No. 272,165
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



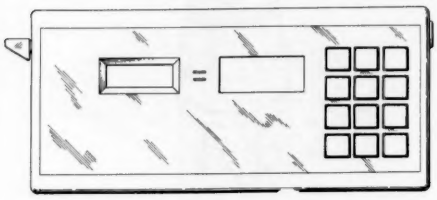
234,358
FREESTANDING FIREPLACE
Paul H. Lever, Fallbrook, Calif., assignor to Fireplace Corporation of America, Walled Lake, Mich.
Filed Dec. 6, 1973, Ser. No. 422,251
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



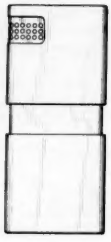
234,359
REGULATOR FOR PRESSURIZED FLUID
Clair Dean Holben and John Joseph Humphrey, Denver, Colo., assignors to C. A. Norgren Co., Littleton, Colo.
Filed July 17, 1972, Ser. No. 272,163
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—21



234,360
TEACHING MACHINE
Ernest R. Duncan, Harmony Hill, Mount Harmony Road, Bernardsville, N.J. 07924
Filed June 8, 1973, Ser. No. 368,267
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D25—1 R

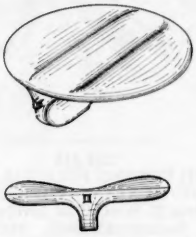


234,361
POCKET LIGHTER
Bernd Figur, Nieder-Roden, Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Germany
Filed May 2, 1973, Ser. No. 356,675
Claims priority, application Germany Nov. 2, 1972
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

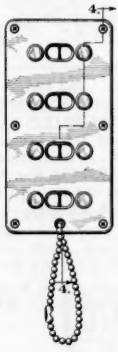


234,362
GLASS MARBLE TURTLE
Thomas R. Mueller, 3600 W. Rodgers St., Milwaukee, Wis. 53215
Filed July 23, 1973, Ser. No. 381,408
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 C

234,363
AQUATIC TOW DISC
Michael Del Vecchio, 140 Regent Ave., Providence, R.I. 02908
Filed Aug. 27, 1973, Ser. No. 391,986
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—42

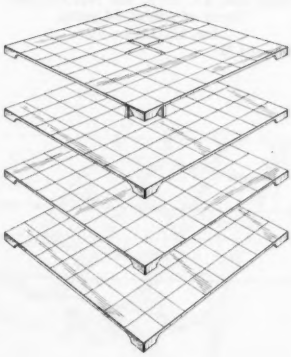


234,364
HORSE SHOE GAME SCORING DEVICE
Frank E. Plush, 7161 Chestnut Drive, Walton Hills, Ohio 44146
Filed July 25, 1972, Ser. No. 274,916
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 MM



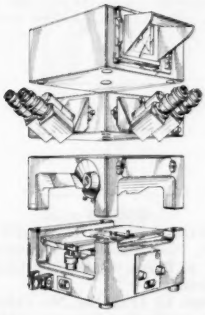
234,365
DOLL OR SIMILAR ARTICLE
Marie Leavitt, 85 Free St., Hingham, Mass. 02043
Filed Aug. 30, 1973, Ser. No. 393,057
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 C

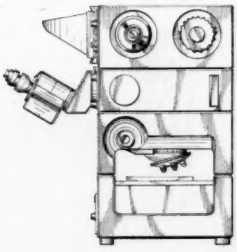
234,366
THREE-DIMENSIONAL GAME BOARD OR SIMILAR ARTICLE
Harry Zelenko, 240 E. 61st St., New York, N.Y. 10021
Filed July 20, 1973, Ser. No. 381,027
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



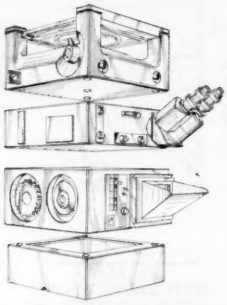
234,367
OIL LAMP
Jon Wolfard, 1553 Sonoma St., Albany, Calif. 94706
Filed Aug. 30, 1973, Ser. No. 392,983
Term of patent 14 years
Int. Cl. D26—*01, 02, 05*
U.S. Cl. D48—24 R

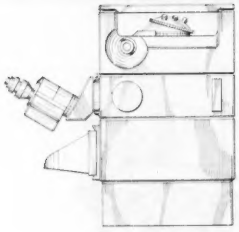
234,368
MICROSCOPE
Kurt Michel, Aalen, Germany, assignor to Carl Zeiss-Stiftung, doing business as Carl Zeiss, Wurttemberg, Germany
Filed Dec. 19, 1973, Ser. No. 426,312
Claims priority, application Germany June 19, 1973
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



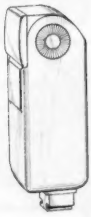


234,369
MICROSCOPE
Kurt Michel, Aalen, Germany, assignor to Carl Zeiss-Stiftung, doing business as Carl Zeiss, Wurttemberg, Germany
Filed Dec. 19, 1973, Ser. No. 426,313
Claims priority, application Germany June 19, 1973
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E





234,370
FLASH UNIT FOR A PHOTOGRAPHIC CAMERA
Robert Oberheim, Neu-Isenberg, Schoenbornring, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Sept. 13, 1972, Ser. No. 288,663
Claims priority, application Germany Mar. 17, 1972
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F



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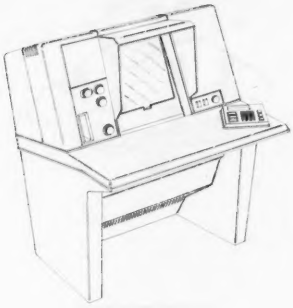
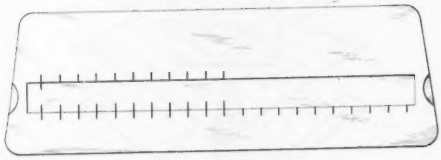
Richard J. Olson, Pittsford, N.Y.
(901 Elmgrove Road, Rochester, N.Y. 14650)
Filed July 13, 1973, Ser. No. 379,149
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 N



234,372
SLIDE COMPUTER
Robert E. Baldwin, 6231 SW. 8th St., Fort Lauderdale, Fla. 33314
Filed Dec. 27, 1971, Ser. No. 212,880
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D64—11 B



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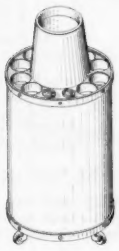
FOOD AND BEVERAGE SERVICE DEVICE FOR CHANGING THE TEMPERATURE OF FOOD AND BEVERAGE CONTAINERS AND THEIR CONTENTS
Vincent J. Gambello, Yonkers, N.Y., assignor to James I. Fisher, Orange, Conn.
Filed Jan. 28, 1974, Ser. No. 437,365
Term of patent 7 years
Int. Cl. D7—*02;* D15—*07*
U.S. Cl. D67—4



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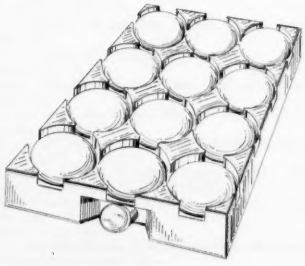
CONTACT REFRIGERATION UNIT FOR CHILLING DRINKING VESSELS
Richard F. Starrett, P.O. Box 838, Tiburon, Calif. 94920
Filed Mar. 1, 1974, Ser. No. 447,131
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D67—4



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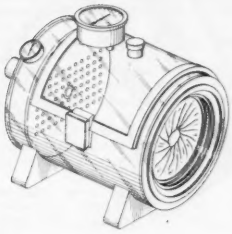
INFANT CHAMBER
Jerry L. Grimes, Pomona, Calif., assignor to The Fluorocarbon Company, Anaheim, Calif.
Filed Mar. 16, 1973, Ser. No. 342,282
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 G



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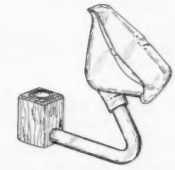
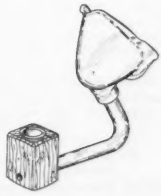
MEDICAMENT INHALANT DISPENSER
William E. Goettelman, Milwaukee, Wis. (Rte. 1, Forestville, Wis. 54213)
Filed Nov. 24, 1972, Ser. No. 309,511
Term of patent 14 years
Int. Cl. D23—*01;* D24—*02*
U.S. Cl. D83—1 N





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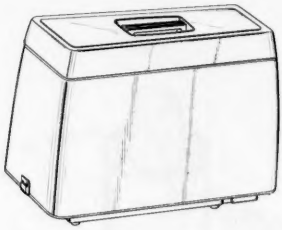
COMBINED DISPLAY CONTAINER AND TOTE BAG
Ned H. Gallasch, Milwaukee, Wis., assignor to ABC Industries, Inc., Milwaukee, Wis.
Filed Dec. 20, 1972, Ser. No. 306,360
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G

234,378
CASE FOR A SEWING MACHINE
Koji Uchida, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Nov. 24, 1972, Ser. No. 309,507
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF FEBRUARY, 1975

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Abu-isa, Ismat A., to General Motors Corporation. Two-component synergistic antioxidant system for polyolefins. 3,867,477, Cl. 260-837.00R.

ACF Industries Incorporated: *See—*
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Acme General Corporation: *See—*
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Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaishi. Ensemble effect imparting device using a bucket brigade device for an electric musical instrument. 3,866,505, Cl. 84-1.240.

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Adams, Kenneth D.; and King, Walter F., to Singer Company, The. Sewing machine frame construction. 3,866,553, Cl. 112-258.000.

Addressograph Multigraph Corporation: *See—*
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Ahmad, Shamim, to B. F. Goodrich Company, The. Tire and wheel combination. 3,866,652, Cl. 152-317.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Fractional current supply. 3,867,685, Cl. 323-4.000.

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Ajrlahi, Mamut. Multiple-switch clock. 3,867,642, Cl. 307-141.000.

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Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis-basic esters of dibenzofuran. 3,867,409, Cl. 260-346.20M.

Alburn, Harvey E., to American Home Products Corporation. Method of treating neisseria infections with 6-[2-(3-amidinoureido)-2-phenyl acetamido]penicillanic acid. 3,867,537, Cl. 424-271.000.

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Alesi, Anthony L.; Stimpert, Verne E.; and Gagne, Roger A., to United States of America, Army. Body armor construction. 3,867,239, Cl. 161-37.000.

Alexander, Charles A.: *See—*
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Aliev, Vagab Safarovich; Kasimova, Adilya Khanum Panakh Kyzy; Muravchik, Mariam Efimovna; Ter-Sarkisov, Benıamin Georgievich; and Kyazimov, Shamil Kyazim Ogly. Method for preparing butadiene and isoprene. 3,867,471, Cl. 260-680.00R.

Allegheny Ludlum Industries, Inc.: *See—*
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Allen & Hanburys Limited: *See—*
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Allied Chemical Corporation: *See—*
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Arenz, Oskar, to Fichtel & Sacks AG. Coupling with tiltable elliptical disc. 3,866,726, Cl. 192-6.00R.
Argus Chemical Corporation: *See—*
Leveskis, Newton G.; and Abma, Charles B., 3,867,461.
Arikawa, Masayasu; Kano, Motomi; and Okuda, Naoki, to Kobe Steel, Ltd. One-side welding process. 3,866,284, Cl. 219-137.000.
Arkovenko, Galina Ivanovna: *See—*
Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich, 3,867,208.
Armco Steel Corporation: *See—*
Easton, Robert W., 3,867,211.
Armour and Company: *See—*
Sato, Kunito; and Herring, Harold K., 3,867,558.
Arnold, Donovan Y., to Caterpillar Tractor Company. Axially adjustable lip seal assembly. 3,866,813, Cl. 277-9.000.
Aronowitz, Frederick, to Honeywell Inc. Laser angular rate sensor biasing apparatus. 3,867,034, Cl. 356-106.0LR.
Arrow Converting Equipment, Inc.: *See—*
Mastriani, Elvin A.; and Pozar, Frank A., 3,866,853.
Arvin Industries, Inc.: *See—*
Glendenning, Don M.; and Bledstein, Louis, 3,866,501.
Asada, Kiyohiko: *See—*
Juna, Kiyoshi; Ohdan, Koji; Nakayama, Hiroyuki; and Asada, Kiyohiko, 3,867,351.
Asahi Glass Company Ltd.: *See—*
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Asai, Masaru: *See—*
Fujimura, Hajime; Suzuki, Kenju; Asano, Osamu; and Asai, Masaru, 3,867,437.
Asanabe, Sizuo: *See—*
Ichiki, Eiichi; Iida, Kazuo; Ogura, Masato; Seki, Yasuo; and Asanabe, Sizuo, 3,867,202.
Asano, Osamu: *See—*
Fujimura, Hajime; Suzuki, Kenju; Asano, Osamu; and Asai, Masaru, 3,867,437.
Ashenfarb, Sidney, to New Age Mirror and Tile Industries, Inc. Three dimensional mirror tile. 3,867,013, Cl. 350-299.000.
Ashmead, Albert S.: *See—*
Shepard, Richard W.; and Ashmead, Albert S., 3,866,456.
Assel, Howard: *See—*
Stengel, Rudolph F.; Stengel, Linda F.; and Assel, Howard, 3,867,655.
Asshauer, Jurgen: *See—*
Halasz, Istvan; Asshauer, Jurgen; Endele, Richard; and De Haas, Klaus, 3,866,308.
Astrocom Division of Q.C.P. Ltd.: *See—*
Junek, Peter G., 3,867,589.
Aterianus, John S., to FMC Corporation. Article transfer mechanism. 3,866,738, Cl. 198-27.000.
Atkinson, Michael; and Hartley, David, to Allen & Hanburys Limited. Preparation of phenylaminoethanols. 3,867,455, Cl. 260-570.600.
Atkinson's of Clitheroe Ltd.: *See—*
Stananought, Leonard William, 3,866,440.
Atlantic Richfield Company: *See—*
Erickson, Henry, 3,867,314.
Striegler, John H., 3,866,988.
Augspurger, Lynn Lawrence. Processes for reproduction of cellular bodies. 3,866,598, Cl. 128-1.00R.

August Heroz Maschinenfabrik: *See*—
Berger, Heinz, 3,866,512.

Aulis, Guntis M.: *See*—
Carroll, William M.; Aulis, Guntis M.; and Starr, Francis C., 3,866,471.

Auman, Paul M.; Bower, John E., Jr.; and Pry, Hugh E., to United States Steel Corporation. Mold for use in continuous-casting of metals. 3,866,664, Cl. 164-283.00M.

Austin, Lowell W.; and Baker, James N., to National Steel Corporation. Apparatus for electrostatically depositing a uniform coating of finely divided coating material on moving substrates. 3,866,571, Cl. 118-621.000.

Auto Specialties Manufacturing Company: *See*—
Graafsma, Richard S., 3,866,881.

Automatic Radio Mfg. Co., Inc.: *See*—
Saunders, Allan L., 3,867,721.

Automatic Research Development Co.: *See*—
Eichenhofer, Josef, 3,866,729.

Automobiles Peugeot: *See*—
Lecailtel, Pierre, 3,867,053.

Avco Corporation: *See*—
Lay, Lowell B., Jr.; and Sanders, Andrew A., 3,867,695.

Avco Everett Research Laboratory, Inc.: *See*—
Curless, Richard W.; Federico, Armando; Magro, Alfred E.; and Rishton, Michael L., 3,866,604.

Aztec Manufacturing Company: *See*—
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B. F. Goodrich Company, The: *See*—
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Kim, Heung T., 3,867,079.
Mikofalvy, Bela K.; and Doyle, Thomas J., 3,867,331.
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B. Rhodes & Son Limited: *See*—
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Babcock and Wilcox Company, The: *See*—
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Badger Company, Inc., The: *See*—
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Beutel, Peter; Jung, Johann; and Rittig, Falk, 3,867,482.
Kiefer, Hans; Mueller, Albrecht; Koenig, Karl-Heinz; Rohr, Wolfgang; and Adolphi, Heinrich, 3,867,428.
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Uhl, Guenter; Dachs, Karl; Helfert, Herbert; and Fikentscher, Rolf, 3,867,172.

Bagby, Thomas L., to Caterpillar Tractor Company. Method and apparatus for tube forming. 3,866,457, Cl. 72-370.000.

Baglai, Vitaly Mikhailovich: *See*—
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Bahal, Surendra M., to American Home Products Corporation. Stabilization of ampicillin with sucrose. 3,867,523, Cl. 424-176.000.

Bahr, Alfred, to Messerschmitt-Bolkow-Blohm GmbH. Ion engine. 3,866,414, Cl. 60-202.000.

Baier, Anton: *See*—
Rudszinat, Willy; Baier, Anton; Heitmann, Uwe; and Brand, Peter, 3,866,708.

Bailey, Stanley M. Pants presser. 3,866,808, Cl. 223-73.000.

Baird-Atomic, Inc.: *See*—
Westell, William, 3,867,038.

Baker, Don R., to Stauffer Chemical Company. Schiff's base dichloroacetamides. 3,867,444, Cl. 260-561.0HL.

Baker, James N.: *See*—
Austin, Lowell W.; and Baker, James N., 3,866,571.

Baker Perkins, Inc.: *See*—
Balazer, Richard J., deceased; and Farrand, James A., administrator, 3,866,825.

Baker, Richard H.; and Bannister, Lawrence H., to Massachusetts Institute of Technology. Electric power converter. 3,867,643, Cl. 307-151.000.

Baker, Terry H.: *See*—
Leybourne, Allen E., III; and Baker, Terry H., 3,867,104.

Bakerdrill, Inc.: *See*—
Curington, Alfred R., 3,866,746.

Balazer, Richard J., deceased; and Farrand, James A., administrator, to Baker Perkins, Inc. Motion sensing lock for securing a cover or guard for a rotatable member such as a centrifugal contactor shaft. 3,866,825, Cl. 233-1.00B.

Baldi, Alfonso; and Damiano, Victor V., to Alloy Surfaces Co., Inc. Coating. 3,867,184, Cl. 117-107.20P.

Balducci, Walter O., to Emhard Corporation. Inactive case for emergency exit bolt. 3,866,730, Cl. 292-92.000.

Baldwin, Francis P.: *See*—
Malatesta, Alberto; and Baldwin, Francis P., 3,867,270.

Baldwin, Gary Lee, to Bell Telephone Laboratories, Incorporated. Compound transistor connection loading for a current. 3,867,650, Cl. 307-235.000.

Baldwin, Thomas I.: *See*—
Dydzyk, Michael, 3,866,888.

Baldwin, William E.: *See*—
Dydzyk, Michael, 3,866,888.

Bangor Punta Operation, Inc.: *See*—
Serota, Rudolph M., 3,866,255.

Banner, Philip M. Automatic fire extinguisher means. 3,866,687, Cl. 169-61.000.

Bannister, Lawrence H.: *See*—
Baker, Richard H.; and Bannister, Lawrence H., 3,867,643.

Barakitis, Nikolaos, to GTE Sylvania Incorporated. Method of manufacturing high pressure sodium arc discharge lamp. 3,866,280, Cl. 29-25.150.

Bardon, Melvin C.; and Bauernfeind, Norman G., to Modine Manufacturing Company. Method of making a heat exchanger and a heat exchanger. 3,866,675, Cl. 165-173.000.

Barker, Robert S., to Halcon International, Inc. Method of oxidizing benzene to maleic anhydride using a vanadium, molybdenum, boron containing catalyst. 3,867,412, Cl. 260-346.80A.

Barnett, Charles B.: *See*—
Kryah, John C.; and Barnett, Charles B., 3,867,593.

Barns, Roy W., to French Oil Mill Machinery Company, The. Continuous process for drying and extracting oils from solid materials. 3,867,416, Cl. 260-412.800.

Barracudaverken Aktiebolag: *See*—
Per Frisk, Karl, 3,866,619.

Barrett, Harrison H.: *See*—
Braun, Martin; Doolittle, Howard D.; Barrett, Harrison H.; Sage, Jay P.; and Wilson, David T., 3,867,637.

Barrett, John C.; and Larson, Roger L., to Raygo, Inc. Control for fluid motor. 3,867,073, Cl. 418-40.000.

Barry Wright Corporation: *See*—
Dean, Carl J.; Wright, David M.; and Cournoyer, Bernard T., 3,866,993.

Barta, Robert W.: *See*—
Tramuta, Salvatore S.; Miller, James G.; Adriance, Howard M.; and Barta, Robert W., 3,866,674.

Bartolles, Rolf: *See*—
Hornfeck, Josef; and Bartolles, Rolf, 3,866,513.

Basf Aktiengesellschaft: *See*—
Hoffmann, Werner; Himmele, Walter; and Aquila, Werner, 3,867,459.

Bashkirov, Andrei Nikolaevich: *See*—
Grozhan, Mark Markovich; Kamzolkin, Vladimir Vasilievich; Lapitsky, Jury Anatolievich; and Bashkirov, Andrei Nikolaevich, 3,867,430.

Batchelor, Donald Sylvester: *See*—
Jenney, John William; Donaghu, Dennis Ambrose; Cartsunis, Louis Peter; and Batchelor, Donald Sylvester, 3,867,125.

Bates, Herbert E.: *See*—
Mlavsky, Abraham I.; Bates, Herbert E.; and Siegel, Bernard, 3,867,496.

Bates, William S.: *See*—
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Batzer, Hans: *See*—
Habermeier, Jurgen; and Batzer, Hans, 3,867,400.

Bauer, Jackson, to Collins and Aikman Corporation. Compacted composite fabrics using thermoplastic adhesives. 3,867,248, Cl. 161-88.000.

Bauer, James J., to Clark Equipment Company. Tractor vehicle with hydrostatic drive means. 3,866,700, Cl. 180-6.480.

Bauernfeind, Norman G.: *See*—
Bardon, Melvin C.; and Bauernfeind, Norman G., 3,866,675.

Baugh, Benton F., to Vetco-Offshore, Inc. Underwater connection apparatus. 3,866,677, Cl. 166-.600.

Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William Russell, to General Electric Company. Horizontal centrifugal casting method. 3,866,661, Cl. 164-114.000.

Baumrucker, George O. Incontinence device. 3,866,611, Cl. 128-346.000.

Bausch & Lomb Incorporated: *See*—
Burns, Richard H., 3,867,011.
More, George H., 3,866,850.

Baxter Laboratories, Inc.: *See*—
Pearce, Larry Neil, 3,866,635.

Bayer Aktiengesellschaft: *See*—
Pedain, Josef; Noll, Klaus; Konig, Klaus; and Thoma, Wilhelm, 3,867,350.
Sommer, Richard; and Wolfrum, Gerhard, 3,867,369.
Wagner, Kuno, 3,867,373.

Beadle, Howard C., to R. F. Vanderbilt Company, Inc. Process of vulcanizing neoprene by using certain 2-hydroxyalkyl N,N-dialkyldithiocarbamates as accelerators. 3,867,359, Cl. 260-79.50C.

Beals, Max D., to Amax Aluminum Company, Inc. Tube connector. 3,867,045, Cl. 403-190.000.

Beatrice Foods Co.: *See*—
Conte, Rolland R., 3,866,785.

Beazley, Rodney Thomas, to Glassmaster Company Limited. Glass washing machines. 3,866,265, Cl. 15-75.000.

Bebart, James A., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming glass fibers and marble delivery means therefor. 3,867,117, Cl. 65-2.000.

Bechtel International Corporation: *See*—
Wasp, Edward J., 3,867,109.

Beck, Reinhold, to Albert Obrist & Co. Dalplast-Produktion. Single-piece plastic closure cap. 3,866,784, Cl. 215-321.000.

Becker, Brant W.: *See—*
Gordon, Bernard M.; Becker, Brant W.; and Prescott, Charles, 3,866,302.

Becker, Ralph S.: *See—*
Guillory, Jack P.; Becker, Ralph S.; and Hughes, William B., 3,867,342.

Beebe, James H.: *See—*
Trogan, John F.; and Beebe, James H., 3,866,905.

Beeson, Eric John George: *See—*
Furmidge, Kenneth Frederick; and Beeson, Eric John George, 3,867,665.

Bekker, Peter O. E. Ground support unit. 3,866,701, Cl. 180-14.00C.

Bell, Allan J.: *See—*
Torpie, John D.; Bell, Allan J.; Gorham, Michael L.; and Keating, Walter G., 3,867,702.

Bell & Howell Co.: *See—*
Carson, Bradley A., 3,867,264.
Mueller, Arthur C.; and Hapke, Kenyon A., 3,867,021.

Bell Punch Company Limited: *See—*
Kitz, Norbert; and Drage, James John, 3,867,675.

Bell Telephone Laboratories, Incorporated: *See—*
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Colton, John Robert; and Mann, Henry, 3,867,579.
Maggs, Charles; and Weick, Walter Werner, 3,867,217.
Pfahl, Robert Christian, Jr.; and Ammann, Hans Hugo, 3,866,307.
Watson, Hugh Alexander, 3,867,569.

Bell, William A. Setting device for cork brick or the like. 3,866,300, Cl. 29-270.000.

Bell, William W., Jr.: *See—*
Bussjager, Rudy C.; and Bell, William W., Jr., 3,866,439.

Beltz, Richard K.; and Hurst, Jerry C., to Western Electric Company, Incorporated. Test probe for integrated circuit chips. 3,867,698, Cl. 324-158.00P.

Bemiss, Robert P., to Robalex, Inc., Trustee. Boilable bakeable package and method. 3,866,816, Cl. 229-14.00B.

Bendix Corporation, The: *See—*
Teitelbaum, Bernard R.; and Slimak, Lawrence E., 3,866,473.

Benisek, Edward F., to Wallace-Murray Corporation. Turbocharger compressor with dual inlet and collector chambers. 3,866,423, Cl. 60-599.000.

Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; and Libby, Erin (assors. to said Benkoe, by said Goldfarb), 3,866,350.
Goldfarb, Adolph E.; and Benkoe, Erwin, 3,866,920.

Benson, Henry, to Warren Industries. Connector for window spacer assembly. 3,866,380, Cl. 52-656.000.

Bentley Engineering Company, Ltd., The: *See—*
Peberdy, Roland, 3,866,441.

Berbeco, George R.: *See—*
Hook, Edwin O.; Berbeco, George R.; and Obermayer, Arthur S., 3,867,186.

Bereza, Helen D. Decorative laundry dryer. 3,866,336, Cl. 34-201.000.

Berg, James W.: *See—*
Tigner, Reuben A.; and Berg, James W., 3,867,315.

Berg Manufacturing Companay, The: *See—*
Klimek, Boleslaw, 3,866,623.

Berger, Charles V., to Universal Oil Products Company. High octane motor fuel production. 3,867,276, Cl. 208-60.000.

Berger, Heinz, to August Heroz Maschinenfabrik. Apparatus for braiding knotless netting. 3,866,512, Cl. 87-37.000.

Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, to Xerox Corporation. Photoelectric and electrophotographic pigments comprising derivatives of condensed polycyclic aromatic hydrocarbon aldehydes. 3,867,141, Cl. 96-1.500.

Bergstrom, Lars Rune; and Ridder, Georg Sven Olof. Mast for sailing yachts and method. 3,866,558, Cl. 114-90.000.

Beriger, Ernst, to Ciba-Geigy AG. S,s-bis-benzyl alkylphosphonates. 3,867,484, Cl. 260-961.000.

Bernard, Jean Claude; and Pascal, Pierre J. Electroplated isotactic polypropylene. 3,866,288, Cl. 29-195.000.

Bernett, Frank E., to Tile Council of America, Inc. Methods of grouting tile. 3,866,383, Cl. 52-744.000.

Bernstein, Seymour: *See—*
Dusza, John Paul; Dindsay, Harry Lee; Child, Ralph Grassing; and Bernstein, Seymour, 3,867,425.

Berry, Ronald Frank, to Pilkington Brothers Limited. Conveying sheet material. 3,866,906, Cl. 271-227.000.

Bertea Corporation: *See—*
Morton, Robert O., 3,866,620.

Bertellotti, Ansano: *See—*
Michalak, Bogumil M.; and Bertellotti, Ansano, 3,867,000.

Berton, Marcello, to Ing. C. Olivetti & C., S.p.A. Collapsible tables. 3,866,549, Cl. 108-153.000.

Bethlehem Steel Corporation: *See—*
Chehi, Stephen E., 3,866,303.
Rohatgi, Pradeep Kumar, 3,867,299.

Betts, Albert Thomas; and Uri, Norbert, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Chromium salicylate catalyzed epoxide-carboxylic acid esterification. 3,867,354, Cl. 260-78.4EP.

Beutel, Peter; Jung, Johann; and Rittig, Falk, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2-Chloroethanephosphonic acid derivatives. 3,867,482, Cl. 260-924.000.

Bigalke, Erhard; and Pundt, Dieter, to Volkswagenwerk Aktiengesellschaft. Switching device and circuit. 3,866,584, Cl. 123-97.00B.

Billman, Harry E., to Raymond Lee Organization, Inc., The. Revolving lighted page makeup for graphic arts. 3,867,622, Cl. 240-2.00P.

Bingham, John A. Recreational vehicle. 3,866,945, Cl. 280-202.000.

Birke, August G., to Shell Oil Company. Dibenzimidazole-diureas. 3,867,399, Cl. 260-309.200.

Birker, Alfred: *See—*
Herveling, Wilhelm; Birker, Alfred; Langefeld, Siegfried; Daimler, Berthold H.; Fett, Gunter; and Dickersbach, Irmgard, 3,866,352.

Birkin, Michael Sambrook, to British Railways Board. Track to train communication systems. 3,867,573, Cl. 178-17.500.

Birrell, Stewart Hector, to Reflex Corporation of Canada Limited. Child proof closure assembly. 3,866,802, Cl. 222-153.000.

Bishop, Larry D.; and Smith, William R., to General Electric Company. Battery charging circuit. 3,867,681, Cl. 320-21.000.

Bissler, William L., to Consolidated Foods Corporation. Slipover cover. 3,866,814, Cl. 229-8.000.

Bitko, Sheldon S., to Fifth Dimension Inc. Position-insensitive mercury relay. 3,867,603, Cl. 200-239.000.

Bjorhaag, Georg. Stone setting machine. 3,867,051, Cl. 404-99.000.

Bjorklund, Fritz Lars Gunnar; and Sternbeck, Olaf, to Telefonaktiebolaget L M Ericsson. Contactless switch. 3,867,652, Cl. 307-309.000.

Black, Sivalls & Bryson, Inc.: *See—*
Honerkamp, Joseph D.; and Tournoux, Paul M., 3,867,112.

Blatt, Leland F. Angular adjustment mount for a workpiece extractor. 3,866,485, Cl. 74-422.000.

Blaxtan, Peter William; Millward, John David; and Such, Richard Thomas, to Decca Limited. System for converting cinematographic film images into television pictures. 3,867,570, Cl. 178-7.200.

Bledstein, Louis: *See—*
Glendenning, Don M.; and Bledstein, Louis, 3,866,501.

Bliss, Erlan S.; and Speck, David Ralph, to United States of America, Atomic Energy Commission. Apodised aperture assembly for high power lasers. 3,867,017, Cl. 350-205.000.

Bloch, Herman S., to Universal Oil Products Company. Biodegradable sulfate detergents. 3,867,421, Cl. 260-457.000.

Bloch, Herman S., to Universal Oil Products Company. Biodegradable sulfonate detergents. 3,867,432, Cl. 260-503.000.

Block, Donald P., to FMC Corporation. Side delivery rake support. 3,866,402, Cl. 56-377.000.

Blomberg, Peter Erik, to Aktiebolaget Electrolux. Method of freezing with the aid of a cooling arrangement having a secondary refrigeration system and primary absorption refrigeration apparatus associated therewith. 3,866,429, Cl. 62-65.000.

Blomberg, Peter Erik, to Aktiebolaget Electrolux. Method of and means for freezing by a cooling arrangement embodying a secondary refrigeration system and primary absorption refrigeration apparatus associated therewith. 3,866,431, Cl. 62-183.000.

Bluem, Gary R. Fluid pressure testing apparatus. 3,866,563, Cl. 116-34.00R.

Blunden, Donald J., to Whitehead & Kales Company. Securement system for rail cars. 3,866,542, Cl. 105-368.00R.

Board of Regents of the University of Washington, The: *See—*
Johnson, Curtis C., 3,866,599.

Bobier, Wilfred S., to Oilgear Company, The. Fluid device having interchangeable displacement control means. 3,866,520, Cl. 91-506.000.

Bodeep, George Edward: *See—*
Alphonse, Gerard Argant; and Bodeep, George Edward, 3,867,108.

Bodson, Fernand Jacques Joseph, to Societe des Mines et Fonderies de Zinc de La Vieille Montagne, Societe Anonyme. Method of preparing a pigment on an iron oxide base. 3,867,516, Cl. 423-632.000.

Boeing Company, The: *See—*
Adams, Clarence R., 3,867,244.
Ratcliff, Ronald R.; Watts, John F.; and Simonson, Alden D., 3,866,861.
Spencer, Willard E., 3,867,663.

Bogomolov, Vladimir Matveevich: *See—*
Pavlov, Anatoly Petrovich; Bogomolov, Vladimir Matveevich; Kupershmidt, Felix Borisovich; Nechitailo, Igor Afanasievich; Nosilov, Nikolai Nikolaevich; and Levin-Kogan, Isaak Zalmanovich, 3,866,673.

Bohl, Lester E.; Rogerson, Roy H.; and Stroke, Frederick G., to PPG Industries, Inc. Treatment of titanium tetrachloride dryer residue. 3,867,515, Cl. 423-593.000.

Bohli, William H., to United States of America, Navy. Adhesive-fastened padeye device. 3,866,873, Cl. 248-205.00A.

Bohme, Ekkehard: *See—*
Dolfini, Joseph Edward; and Bohme, Ekkehard, 3,867,379.

Bohner, Beat; Dawes, Dag; and Meyer, Willy, to Ciba-Geigy Corporation. Triazolyl phosphorus compounds. 3,867,397, Cl. 260-308.00R.

Bohner, Beat; Dawes, Dag; and Meyer, Willy, to Ciba-Geigy Corporation. Triazolyl phosphorus compounds. 3,867,398, Cl. 260-308.00R.

Bohner, Beat: *See—*
Dawes, Dag; and Bohner, Beat, 3,867,396.

Bok, Lowell D.: *See—*
Van Horn, Russell F.; Bok, Lowell D.; King, Albert C., Jr.; Suerdieck, Ronald R.; and Thrower, Arthur J., 3,867,230.

Boliden Aktiebolag: *See—*
Gorling, Karl Goran, 3,867,490.

Bombardier Limited: *See—*
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Bondarenko, Oleg Petrovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Bondi, Emanuele, to Fieldcrest Mills, Inc. Method of making pile fabrics from a block of pile material. 3,867,219, Cl. 156-72.000.

Boney, William G.; and Kuchar, Paul J., to Universal Oil Products Company. Alkylation apparatus. 3,867,103, Cl. 23-288.00E.

Boney, William G., to Universal Oil Products Company. Nonregenerative hf alkylation process. 3,867,474, Cl. 260-683.480.

Boni, Richard R.: *See—*
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Borenstein, David E., to Phillips Petroleum Company. Polypropylene filaments having improved soiling and crocking characteristics. 3,867,187, Cl. 117-138.80E.

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Bower, John E., Jr.: *See—*
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Bowers, Bernard P.; and Breidegam, Delight E., Jr., to East Penn Manufacturing Company, Inc. Battery holddown. 3,866,704, Cl. 180-68.500.

Bowers, Bobby O.; and Brzozowski, Stanley F., to PPG Industries, Inc. Method and apparatus for chlorinating metal bearing materials. 3,867,505, Cl. 423-74.000.

Boxer, Steve. Process and device for alleviation of non-mucscular pain. 3,866,597, Cl. 128-1.00R.

Boyajy, Louis D.; and Gogerty, John H., to Sandoz-Wander, Inc. Diazabicyclodecanes as anti-ulcer agents. 3,867,532, Cl. 424-251.000.

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Bozek, John S., to Continental Can Company. Childproof pill dispenser. 3,866,796, Cl. 221-152.000.

Bracco Industria Chimica Societa per Azioni: *See—*
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Bradford, John Guythar. Adjustable back-rest. 3,866,250, Cl. 5-76.000.

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Brainard, Kenneth Lynley: *See—*
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Brand, Erich; and Saffran, Helmut, to Chemiebau Dr. A. Zieren GmbH & Co. KG. Cleaning of the lower finned tubes in the separation of phthalic anhydride. 3,867,410, Cl. 260-346.400.

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Brandstetter, Robert, to Commissariat a l'Energie Atomique. Device for sealing a rotating plug in a nuclear reactor. 3,867,254, Cl. 176-87.000.

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Braun, Martin; Doolittle, Howard D.; Barrett, Harrison H.; Sage, Jay P.; and Wilson, David T., to Raytheon Company. Extended monochromatic x-ray source. 3,867,637, Cl. 250-503.000.

Braun, Robert A. Golf cart umbrella holder. 3,866,934, Cl. 280-36.00C.

Braunhut, Harold N. Controlled light limiting lens assembly. 3,867,020, Cl. 351-45.000.

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Brewer, Clarence, Sr. Gang rip saw. 3,866,502, Cl. 83-477.200.

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Bringmann, William F. Shopping cart handle cover. 3,866,649, Cl. 150-52.00R.

Brinkley, Max D.; and Griffiths, Robert I., to Goodyear Tire & Rubber Company, The. Tire building machine. 3,867,228, Cl. 156-405.000.

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Brown, Gaylord W.; and Pickard, George L., to Koehring Company. Apparatus for fabricating a hollow article. 3,867,088, Cl. 425-504.000.

Brown, Henry; Tomaszewski, Thaddeus W.; and Clauss, Richard J., to Oxy Metal Finishing Corporation. Micro-porous chromium on nickel-cobalt duplex composite plates. 3,866,289, Cl. 29-194.000.

Brown, Henry; and Boycott, William A., to Oxy Metal Finishing Corporation. Chromium plating. 3,867,267, Cl. 204-51.000.

Brown, Karl L.; and Turnbull, William G., to Varian Associates. Achromatic magnetic beam deflection system. 3,867,635, Cl. 250-396.000.

Brown, Michael R.: *See—*
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Brown, Roger M., to Scientific Technology Incorporated. Pulsed light receiver and method. 3,867,628, Cl. 250-206.000.

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Bruder, Robert G. Injection mold. 3,867,080, Cl. 425-247.000.

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Bullock, Greg A.; and Sheeran, Patrick J. 2-Amino-4(3H)-quinazolinones. 3,867,384, Cl. 260-256.40Q.
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Ciciora, Walter S.; and Merrell, Richard G., to Zenith Radio Corporation. Digital anti-jitter circuit for vertical scanning system. 3,867,575, Cl. 178-69.5TV.
Cincinnati Milacron Inc.: *See*—
Kimmelaar, Rudolf Johan, 3,866,489.
Ciokajlo, John J., to General Electric Company. Fan blade actuator using pressurized air. 3,866,415, Cl. 60-226.00R.
Ciric, Julius: *See*—
Fischer, Ronald H.; Ciric, Julius; and Whyte, Thaddeus E., Jr., 3,867,282.
Claesson, Tore Vilhelm; and Rojd, Johan Esbjorn, to Sandvik Aktiebolag. Saw blade. 3,866,504, Cl. 83-852.000.
Clark Equipment Company: *See*—
Anderson, Charles M.; and Sturtz, Charles R., Jr., 3,866,705.
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Clark, Harold A., to Dow Corning Corporation. Method of constructing a solar energy collector. 3,866,285, Cl. 29-157.00R.
Clark, John C.: *See*—
Nelson, Melvin A.; Davies, Terence J.; and Clark, John C., 3,867,627.
Clarke, William A. Water actuated ring toss target. 3,866,916, Cl. 273-105.200.
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Brown, Henry; Tomaszewski, Thaddeus W.; and Clauss, Richard J., 3,866,289.
Claxton, Gerald L.; and Evulich, Barris J., to Up-Right, Inc. Harvesting machine with under-vine closure. 3,866,401, Cl. 56-330.000.
Clendinning, Robert A.; Potts, James E.; and Cornell, Stephen W., to Union Carbide Corporation. Environmentally degradable-biodegradable blend of an oxyalkanoyl polymer and an environmentally degradable ethylene polymer. 3,867,324, Cl. 260-23.00H.
Cline, Ronald L., to Signetics Corporation. High speed low power schottky integrated logic gate circuit with current boost. 3,867,644, Cl. 307-213.000.
Coats Company, Inc., The: *See*—
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Cobia, Barnell L., to Green Island International, Inc. Potted plant display devices. 3,866,351, Cl. 47-38.100.
Cochran, David S., to Hewlett-Packard Company. Driver. 3,867,649, Cl. 307-268.000.
Coffey, John William; and Hansen, Hans John, to Hoffmann-La Roche Inc. Radioimmunoassay for insulin. 3,867,518, Cl. 424-1.000.
Coffey, Manus, to Murco Environmental Limited. Refuse collector body. 3,866,778, Cl. 214-508.000.
Cohen, Ella: *See*—
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Cole, Henry B., to American Optical Corporation. Method of coating channeled energy-conducting plates. 3,867,183, Cl. 117-107.20R.
Coleco Industries, Inc.: *See*—
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Collins and Aikman Corporation: *See*—
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Colton, John Robert; and Mann, Henry, to Bell Telephone Laboratories, Incorporated. Synchronization apparatus for a time division switching system. 3,867,579, Cl. 179-15.00A.
Commissariat a l'Energie Atomique: *See*—
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Compagnie Internationale pour l'Informatique: *See*—
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Cone, Irwin C., to Gates Rubber Company, The. Low silhouette connector for windshield wiper blades. 3,866,260, Cl. 15-250.320.

Conklin, Harold A., Jr., to D. H. Baldwin Company. Soundboard construction for stringed musical instruments. 3,866,506, Cl. 84-195.000.

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Cooper, George R. Reversible snow plow attachment for wheeled vehicles. 3,866,342, Cl. 37-117.500.

Cooper, Ronald H., to Dow Chemical Company, The. N-heterocyclic compounds as additives to cement systems. 3,867,160, Cl. 106-90.000.

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Coratomic Inc.: *See—*
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Corey, Elias J. Reagents for the stereoselective generation of the chiral sidechain carbinol unit (C-15) in prostaglandin synthesis. 3,867,460, Cl. 260-606.50B.

Cormier, Louis A. Stair tread. 3,866,268, Cl. 16-10.000.

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Corsmeier, Robert J.; Corrigan, Charles E.; and Dennis, Ronald E., to General Electric Company. Turbomachinery blade cooling insert retainers. 3,867,068, Cl. 416-97.000.

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Zucker, Jonas; Trask, Russell L.; and Costa, Edward, 3,867,215.

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Cotter, Ray W., to Calspan Corporation. Method and apparatus for increasing the reynolds number capability in a transonic wind tunnel. 3,866,466, Cl. 73-147.000.

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Crabbe, Pierre, to Syntex (U.S.A.) Inc. Difluoromethylene substituted prostaglandin derivatives. 3,867,423, Cl. 260-468.00D.

Cramer, Christoph; Schmidtchen, Hans-Martin; Schwartze, Hans Jurgen; and Eichmeyer, Bernd, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Tube bundle cable. 3,866,670, Cl. 165-47.000.

Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., to Electroprint, Inc. Method and apparatus for forming a positive electrostatic image. 3,867,673, Cl. 317-262.00R.

Crawford, Howard E.: *See—*
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Crespolini, Giancarlo: *See—*
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Crochet, Gerald J., Sr. Coupling mechanism with latching also with relative universal movement uncovering between objects. 3,866,948, Cl. 280-478.00R.

Crompton & Knowles Corporation: *See—*
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Cross, Barrington; and Grasso, Charles Paul, to American Cyanamid Company. Alkynyloxy)alkyl and (alkenyloxy)alkyl carbamates. 3,867,429, Cl. 260-479.00C.

Cross, Peter Edward; and Gadsby, Brian, to Pfizer Inc. 2 and 3-substituted-4-(heterocyclic-amino-sulfonyl)benzene sulfonamides. 3,867,390, Cl. 260-293.730.

Crouser, Darwin S.; and Powers, Joseph A., to Hoover Company, The. Cleaner with auxiliary air flow. 3,866,263, Cl. 15-412.000.

Cruzado, Santos; Dascaloff, Stanley Nicholas; Tolls, John George; and Torvend, Eugene Fraley, to General Electric Company. Continuous casting apparatus. 3,866,570, Cl. 118-405.000.

Cryo-Chem, Inc.: *See—*
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Csathy, Denis G., to Deltak Corporation. Fume incinerator. 3,867,102, Cl. 23-277.00C.

Curington, Alfred R., to Bakerdrill, Inc. Rotary bore hole air hammer drive mechanism. 3,866,746, Cl. 173-73.000.

Curless, Richard W.; Federico, Armando; Magro, Alfred E.; and Rishton, Michael L., to Avco Everett Research Laboratory, Inc. External cardiac assistance. 3,866,604, Cl. 128-64.000.

Curtiss-Wright Corporation: *See—*
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Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
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Dalton, James T.; and Wright, Ralph R., to United States of America, Atomic Energy Commission. Method for plating race-type assemblies. 3,867,176, Cl. 117-50.000.

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Daren, Stephen: *See—*
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Darragh, Richard T.; and Stone, James L., to Procter & Gamble Company, The. Fats with encapsulated flavors. 3,867,556, Cl. 426-98.000.

Dascaloff, Stanley Nicholas: *See—*
Cruzado, Santos; Dascaloff, Stanley Nicholas; Tolls, John George; and Torvend, Eugene Fraley, 3,866,570.

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Davis, Raymond A., to Grant, Frank A. Tray wrapping apparatus and method. 3,866,387, Cl. 53-42.000.

Davy-Ashmore Aktiengesellschaft: *See—*
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Decca Limited: *See—*
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Decker, Herbert, to Triumph Werke Neurnberg A.G. Rotational positioning mechanism for single element printer. 3,866,735, Cl. 197-55.000.

Decker, John J.; and Zito, Susan V., to GTE Sylvania Incorporated. Method of blackening a steel component for a color cathode ray tube. 3,867,207, Cl. 148-6.14R.

Deering Milliken Research Corporation: *See—*
Eschenbach, Paul W., 3,866,849.

DeGraw, Frank B. Wiper assembly for side-mounted rear view mirror. 3,866,258, Cl. 15-250.290.

De Haas, Klaus: *See—*
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DeLoach, Wells D. Combination skid and coupling assembly. 3,866,951, Cl. 285-5.000.

Deltak Corporation: *See—*
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Dennis, Ronald E.; and Treece, William D., to General Electric Company. Apparatus for constructing air cooled turbomachinery blading. 3,866,448, Cl. 72-30.000.

Dennis, Ronald E.: *See—*
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Denton, Medona Bonner, to Research Corporation. Pulsed ultrasonic nebulization system and method for flame spectroscopy. 3,866,831, Cl. 239-4.000.

Deprez, Thomas A., to Gleason Works, The. Compacting apparatus having improved rotating table means for indexing molds to and from a compacting chamber. 3,867,077, Cl. 425-405.00A.

DeSantis, Nino M., to Militana, Salvatore G., a part interest. Protective garment for karate with force indicating members thereon. 3,866,909, Cl. 272-76.000.

De Schutter, Camiel R., to Perfect Module Systems, Inc. Wall panel spacer. 3,866,377, Cl. 52-508.000.

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Detwiler, Grant R.; and Chastain, Ronald E., to United States of America, Army. Limit display circuit for radiation source analysis. 3,867,036, Cl. 356-121.000.

Deutsche Gesellschaft fur Schadlingbekampfung GmbH: *See—*
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Diamond, Julius, to William H. Rorer, Inc. Phenyl butyric acids and derivatives thereof. 3,867,434, Cl. 260-515.00A.

Diamond, Julius; and Santora, Norman J., to William H. Rorer, Inc. Substituted phenylacetic acid compounds. 3,867,435, Cl. 260-515.00A.

Diana, Guy D.; and Cutler, Royal A., to Sterling Drug Inc. 1,1-bridged-bis(N-aralkyl-2-aminoethanols). 3,867,454, Cl. 260-570.50P.

Dickersbach, Irmgard: *See—*
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Diebold, Incorporated: *See—*
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Diem, Rudolf, to SKF Kugellagerfabriken GmbH. Fluid support and drive arrangement for roller testing devices. 3,866,775, Cl. 214-340.000.

Diermayer, Alphons; Kutzner, Luitpold; Postenrieder, Erwin; and Diermayer, Werner, to Kutzner, Luitpold; and Diermayer, Werner, part interest to each. Gas fired heating installation. 3,866,594, Cl. 126-112.000.

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Diermayer, Alphons; Kutzner, Luitpold; Postenrieder, Erwin; and Diermayer, Werner, 3,866,594.

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Dlugopolski, Joseph J., to Inland Container Corporation. Fiberboard container for packaging an article. 3,866,745, Cl. 206-45.140.

Dobeus, William J.; Cheetham, James V.; Pacheco, Daniel; Keyzer, Carl A.; and Sandrock, Don G., to Allis-Chalmers Construction Machinery Inc. Rollover protection apparatus. 3,866,942, Cl. 280-150.00C.

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Dochterman, Richard W., to General Electric Company. Dynamoelectric machines and methods of making the same. 3,867,658, Cl. 310-71.000.

Dr. Carl Hahn GmbH: *See—*
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Doerfling, Ralph G., to Detroit Gasket & Manufacturing Company. Decorative resilient laminar panel. 3,867,240, Cl. 161-41.000.

Doerner, William A., to du Pont de Nemours, E. I., and Company. Method of heat exchange using rotary heat exchanger. 3,866,668, Cl. 165-1.000.

Doherty, John Joseph, Jr., to IFE Division of Plastic Mold & Engineering Company. Electronic microelement assembly. 3,866,999, Cl. 339-17.0CF.

Doig, Ian Dracup, to Unisearch Limited. Devices whereby the local fluid rates in a fluidised bed are made to fluctuate. 3,867,114, Cl. 55-77.000.

Doleman, Jack; and Hills, William H., to Monsanto Company. Ring assembly. 3,866,404, Cl. 57-119.000.

Dolfini, Joseph Edward; and Bohme, Ekkehard, to E. R. Squibb & Sons, Inc. 7-Substituted cephalosporanic acid and derivatives thereof. 3,867,379, Cl. 260-243.00C.

Domestic Fabrics Corporation: *See—*
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Donaghu, Dennis Ambrose: *See—*
Jenney, John William; Donaghu, Dennis Ambrose; Cartsunis, Louis Peter; and Batchelor, Donald Sylvester, 3,867,125.

Donahue, Jack R. Drag reducing apparatus for a trailer. 3,866,968, Cl. 296-1.00S.

Dongelmans, Anthony A., to Allied Chemical Corporation. Automatic pick-up device for holding a carrier. 3,866,779, Cl. 214-621.000.

Donki Kagaku Kogyo Kabushiki Kaisha: *See—*
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Donovick, Richard, to E. R. Squibb & Sons, Inc. Enzyme-resistant compositions containing penicillin in combination with 6-apa. 3,867,538, Cl. 424-271.000.

Doolittle, Howard D.: *See—*
Braun, Martin; Doolittle, Howard D.; Barrett, Harrison H.; Sage, Jay P.; and Wilson, David T., 3,867,637.

Dorazio, Alton, Jr.; Altenburger, Otto; and Neumeier, Gunter F. Control system for switching networks. 3,867,583, Cl. 179-18.00E.

Dornheim, Gunther: *See—*
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Dornte, Ralph William, to ESB Incorporated. Non-fogging material. 3,867,175, Cl. 117-47.00A.

Dorsey, Ted C. Wire wrap tool. 3,866,846, Cl. 242-7.060.

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Dowd, Leo J. Propelling shoe for use in an irrigation system. 3,866,835, Cl. 239-177.000.

Dowd, Leo J. Self propelled irrigation system with clutch. 3,866,836, Cl. 239-177.000.

Downing, George W., to Lake Geneva Metal Spinning Company, Inc. Small animal and poultry feeder. 3,866,576, Cl. 119-18.000.

Downing, James W., to McDonnell Douglas Corporation. Secondary safety device and joint. 3,867,044, Cl. 403-155.000.

Dowty Hydraulic Units Limited: *See—*
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Doyle, Thomas J.: *See—*
Mikofalvy, Bela K.; and Doyle, Thomas J., 3,867,331.

Drabek, Jozef; and Varsanyi, Denis, to Ciba-Geigy Corporation. Insecticidal and acaricidal substituted phenyl-thiophosphoric acid esters. 3,867,525, Cl. 424-211.000.

Drage, James John: *See—*
Kitz, Norbert; and Drage, James John, 3,867,675.

Drennen, William Miller, Jr.: *See—*
Whatley, Thomas Jefferson; and Drennen, William Miller, Jr., 3,867,022.

Dreshman, Roy H., to R. H. Dreshman & Sons, Inc. Rock and pinion actuated machine. 3,866,484, Cl. 74-422.000.

Dresser Industries, Inc.: *See—*
Jackson, Robert Allen, 3,866,695.
Marsh, Barry T., 3,866,798.

Drill-Au-Mation, Inc.: *See—*
Smith, Hubert Irvin; and Ott, Fred L., 3,866,468.

Driver, Michael C.; and Geisler, Martin J., to Westinghouse Electric Corporation. Method for making the self-aligned gate contact of a semiconductor device. 3,866,310, Cl. 29-571.000.

Droll, Hans. Apparatus for winding coils for stators of electrical machines. 3,866,847, Cl. 242-7.090.

Dromsky, John A., to Texas Instruments Incorporated. Composite material, tubing made from the material, and methods for making the material and tubing. 3,867,212, Cl. 148-127.000.

Drostholm, Hilmar Frede. Method of manufacturing objects containing a cavity filled with a rigid foam of polyurethane. 3,867,492, Cl. 264-46.600.

Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, to Ciba-Geigy AG. Trifluoromethylphenyl-formamadines and acetamidines. 3,867,448, Cl. 260-564.00R.

Duetze, Karl Heinz. Percussion arrangements. 3,867,653, Cl. 310-8.700.

Dufaylite Developments Limited: *See—*
Weeks, Reginald Arthur; and Cowling, Derek Stanley, 3,866,392.

Dulude, Donald O.; and Winbigler, Paul H., to Kuhlman Corporation. Methods for the manufacture of spring assemblies. 3,866,287, Cl. 29-173.000.

Dunlap, Harold E., to Lodding Engineering Corporation. Self-adjusting doctor blades. 3,866,266, Cl. 15-256.510.

Dunlap, Jerald V., to Intercompressor, Inc. System for supporting and aligning drive motors. 3,866,865, Cl. 248-2.000.

Dunlop, James D.; Giner, Jose; Van Ommering, Gerrit; and Stockel, Joseph F., to Communications Satellite Corporation. Nickel hydrogen cell. 3,867,199, Cl. 136-28.000.

Dunn, George L.; and Hoover, John R. E., to SmithKline Corporation. 3-Heterocyclic thiomethylcephalosporins. 3,867,380, Cl. 260-243.00C.

du Pont de Nemours, E. I., and Company: *See—*
Cherkofsky, Saul Carl, 3,867,447.
Doerner, William A., 3,866,668.
MacLachlan, Alexander, 3,867,153.
Schick, Mary Margaret, 3,867,180.

Dupuy, Robert S., Sr. Pipe hanger. 3,866,871, Cl. 248-59.000.

Duquesne, Victor. Device for inflating tubeless automobile tires. 3,866,654, Cl. 157-1.100.

Durham, Bruce: *See—*
Schmidt, Henry, Jr.; and Durham, Bruce, 3,867,291.

Durham, Harvey. Sheep's foot roller with lifting mechanism. 3,867,052, Cl. 404-121.000.

Dusza, John Paul; Dindsay, Harry Lee; Child, Ralph Grassing; and Bernstein, Seymour, to American Cyanamid Company. Substituted benzyl carbazic acid esters. 3,867,425, Cl. 260-471.00C.

Dydzyk, Michael, to Baldwin, Thomas I.; Baldwin, William E.; and Scrivener, Frank P., a part interest to each. Apparatus for making hot asphalt paving material. 3,866,888, Cl. 259-158.000.

Dynamics Research Corporation: *See—*
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Dynamit Nobel Aktiengesellschaft: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
Dolfini, Joseph Edward; and Bohme, Ekkehard, 3,867,379.
Donovick, Richard, 3,867,538.

Eajardo, Raoul J. Noncircular head joint for a concert flute and method of manufacture. 3,866,507, Cl. 84-384.000.

Earley, James Valentine; Fryer, Rodney Ian; and Walser, Armin, to Hoffman-La Roche Inc. 2-lower alkysulfonyl-1H-1,4-benzodiazepines. 3,867,370, Cl. 260-239.0BD.

East Penn Manufacturing Company, Inc.: *See—*
Bowers, Bernard P.; and Breidegam, Delight E., Jr., 3,866,704.

Eastham, John Frederick, to K. G. Engineering Laboratories Limited. Accelerator for car transmission system. 3,866,702, Cl. 180-65.00R.

Eastham, John Frederick, to K. G. Engineering Laboratories Limited. Electric drive transmission systems. 3,866,703, Cl. 180-65.00R.

Eastman Kodak Company: *See—*
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Thompson, David L.; and Wardell, Everett B., 3,867,232.

Easton, Robert W., to Armco Steel Corporation. Low-oxygen, silicon-bearing lamination steel. 3,867,211, Cl. 148-31.550.

Ebner, Ludwig: *See—*
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Ebner, Norbert, to U.S. Philips Corporation. Method of treating periodontal disease. 3,867,524, Cl. 424-180.000.

Eckel, Robert A.: *See—*
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Eder, Erich; and Brey, Josef, to Kronsecler, Herman. Labeling machine with retractable label supports. 3,867,233, Cl. 156-571.000.

Edmonds, James T., Jr., to Phillips Petroleum Company. Impermeable, nonporous polyarylene sulfide laminate and process therefor. 3,867,189, Cl. 117-138.8UA.

Edward C. Levy Company: *See—*
Paulsen, Lewis A., 3,867,640.

Edwards, Bryant, to Illinois Tool Works Inc. Apparatus for molding a plastic container. 3,867,086, Cl. 425-387.00B.

Egawa, Mitsuru; Akahane, Masahiro; and Sanada, Tomohiro, to Tokyo Seimitsu Co., Ltd. Method and apparatus for measuring concentricity. 3,866,829, Cl. 235-151.300.

Eibes, Carl B. H., deceased (by Eibes, Ursula, nee Waschau); Eibes, Christian; Eibes, Carl-Herwig; and Wagner, Maria-Theresia, nee Eibes. Self-tapping threaded bushings. 3,866,510, Cl. 85-47.000.

Eibes, Carl-Herwig: *See—*
Eibes, Carl B. H., deceased; Eibes, Christian; Eibes, Carl-Herwig; and Wagner, Maria-Theresia, nee Eibes, 3,866,510.

Eibes, Christian: *See—*
Eibes, Carl B. H., deceased; Eibes, Christian; Eibes, Carl-Herwig; and Wagner, Maria-Theresia, nee Eibes, 3,866,510.

Eibes, Ursula, nee Waschau: *See—*
Eibes, Carl B. H., deceased; Eibes, Christian; Eibes, Carl-Herwig; and Wagner, Maria-Theresia, nee Eibes, 3,866,510.

Eichenhofer, Josef, to Automatic Research Development Co. Electromagnetic operated clutches and brakes. 3,866,729, Cl. 192-84.00C.

Eichmeyer, Bernd: *See—*
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Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, to Robert Bosch G.m.b.H. Brace anti-lock test system. 3,866,980, Cl. 303-21.0AF.

Eisele, Hermann: *See—*
Rabus, Friedrich; Peter, Bernd; and Eisele, Hermann, 3,866,979.

Eldridge, Kenneth L., Jr.: *See—*
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Electric Power Storage Limited: *See—*
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Electronic Arrays, Inc.: *See—*
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Electroprint, Inc.: *See—*
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Elepon Technical Center Kabushiky Kaisha: *See—*
Iwahara, Masakuni, 3,866,841.

Elizondo, David Villarreal; Rendon, Armando Reyna; and Murphy, Patrick W. MacKay. Water leak valve. 3,866,879, Cl. 251-145.000.

Elkins, Luejene, to Bunker Ramo Corporation. Multi-conductor connector apparatus for telephone and other data transmission systems. 3,866,996, Cl. 339-99.00R.

Elkins, Paul A.; Miller, Ralph A.; and Scheer, Lawrence E., to Garrett Corporation, The. Double check valve between separable inflatable units. 3,866,734, Cl. 193-25.00B.

Ell, Robert J., to Polaroid Corporation. Sealing apparatus for a self-processing cassette. 3,867,023, Cl. 352-130.000.

Elliott, Curtis H., Jr.; and Guidry, Hanson Lee, to W. R. Grace & Co. Catalyst compositions. 3,867,310, Cl. 252-455.00Z.

Elliott, Curtis Homer, Jr. Process for preparing a petroleum cracking catalyst. 3,867,308, Cl. 252-455.00Z.

Ellis, Carleton, Jr.: *See—*
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Elliston, Thomas L., to Martin Concrete Engineering Company. Orbital vibrator. 3,866,480, Cl. 74-87.000.

Ellsworth, Robert Edgewood, to American Cyanamid Company. Adhesive color printing system for floor coverings and other home furnishings fabrics. 3,867,171, Cl. 117-38.000.

Elm Design, Inc.: *See—*
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Elmore, Dan E.: *See—*
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Elsea, Arthur R.: *See—*
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Elsner, Bertram F.; and Elsner, Frank, Jr., to Elsner Engineering Works, Inc. Roll wrapping machine. 3,866,389, Cl. 53-76.000.
Elsner Engineering Works, Inc.: *See—*
Elsner, Bertram F.; and Elsner, Frank, Jr., 3,866,389.
Elsner, Frank, Jr.: *See—*
Elsner, Bertram F.; and Elsner, Frank, Jr., 3,866,389.
Elste, Edward G., Jr., to Chevron Research Company. Bituminous emulsions useful with mixtures of siliceous and limestone aggregate. 3,867,162, Cl. 106-277.000.
Eltsov, Konstantin Sergeevich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.
Emco Limited: *See—*
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Emerson Electric Co.: *See—*
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Emhard Corporation: *See—*
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Emhart Corporation: *See—*
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Puskarz, Stanley J.; and Lattke, Horst G., 3,866,391.
EMI Limited: *See—*
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Endele, Richard: *See—*
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Endou, Akira; Maeda, Masao; Okumichi, Toshiharu; Nakayasu, Teruo; and Hamada, Takao, to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha. Ortho-methylation of a phenol. 3,867,466, Cl. 260-621.00R.
Endress, James W., to Carrier Corporation. Motor cooling apparatus utilizing a refrigerant flow circuit. 3,866,438, Cl. 62-468.000.
Endriz, John Guiry, to RCA Corporation. Grating tuned photoemitter. 3,867,662, Cl. 313-94.000.
Endzweig, Abraham. Plug connections for vertically abutting frame sections. 3,867,048, Cl. 403-252.000.
Eng, Yat L. Barbecue pan structure. 3,866,526, Cl. 99-357.000.
Engel, Andreas Hermann, to Turlabor AG. Optical correlator. 3,867,639, Cl. 250-550.000.
Engler Instrument Company: *See—*
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Engquist, Jan-Eric, to Forenade Fabriksverken. Cleaning device. 3,866,264, Cl. 15-421.000.
Engstrom, Folk, to A. Ahlstrom Osakeyhtio. Metallurgical production method. 3,867,131, Cl. 75-25.000.
Ensmann, Burt; Ieda, Michael; and Joshi, Madhusudan, to Ideal Toy Corporation. Gunfight game. 3,866,917, Cl. 273-120.00R.
Entropy Limited: *See—*
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Environmental Sciences Corporation: *See—*
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Envirotech Corporation: *See—*
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Eppe, Rudolf; Hartwig, Karl; and Vossnacke, Juergen, to Agfa-Gevaert Aktiengesellschaft. Sheet feeding apparatus. 3,866,903, Cl. 271-119.000.
Epstein, Martin: *See—*
Schmitt, Edward Emil; and Epstein, Martin, 3,867,190.
Ergene, Mehmet T., to Stanley Works, The. Foamed concrete structures. 3,867,159, Cl. 106-88.000.
Erickson, Henry, to Atlantic Richfield Company. Process for the preparation of a supported iridium catalyst. 3,867,314, Cl. 252-466.0PT.
Eriksson, Lars Anders; and Oberg, Karl-Erik, to Uddeholms Aktiebolag. Decarburisation of chromium containing iron, cobalt or nickel based alloys. 3,867,136, Cl. 75-60.000.
Eriksson, Lars Anders: *See—*
Johnsson, Hans Klas Olof; and Eriksson, Lars Anders, 3,867,135.
Ernst Leitz GmbH: *See—*
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Erwin, Warren L. Auto ignition lock. 3,866,445, Cl. 70-428.000.
ESB Incorporated: *See—*
Dornte, Ralph William, 3,867,175.
Esch, Henry. Multiple cable conductor identification apparatus. 3,867,692, Cl. 324-66.000.
Eschbach, Robert C.; and Colligan, John B., to Aztec Manufacturing Company. Extruded columnar frame for partitions, walls and enclosures. 3,866,381, Cl. 52-731.000.
Eschenbach, Paul W., to Deering Milliken Research Corporation. Apparatus for producing a novel yarn package. 3,866,849, Cl. 242-47.000.
Escher Wyss Limited: *See—*
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Eshelman, Cheston Lee. Lateral motion bumper system. 3,866,962, Cl. 293-19.000.
Esso Research and Engineering Company: *See—*
Malatesta, Alberto; and Baldwin, Francis P., 3,867,270.
Establissement Wanderfield & Co.: *See—*
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Estes, John H.; and Cole, Edward L., to Texaco Inc. Isoparaffin alkylation. 3,867,475, Cl. 260-683.630.
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Wall, Henry H., Jr., 3,867,263.
Evans, David, to International Nickel Company, Inc, The. Pellet segregation and apparatus therefor. 3,866,754, Cl. 209-73.000.
Evans, Stephen M., Jr., to ITP Corporation. Flow control shrink wrap tunnel. 3,866,331, Cl. 34-216.000.
Everett, George, to Gros-Tte Industries, Inc. Apparatus for dispensing predetermined quantities of plastic material by blade means having rotational and translational movement. 3,867,081, Cl. 425-295.000.
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O'Farrell, Charles P.; and Higgins, John J., 3,867,247.
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Eyerman, J. R. Photographic reflector. 3,867,019, Cl. 350-295.000.
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Fabenco Incorporated: *See—*
La Cook, Hardy L.; and Conklin, John H., 3,866,356.
Fabrygel, Joe H. Scraper bucket with tiltable axle assembly. 3,866,341, Cl. 37-129.000.
Fahey, Dennis M., to PPG Industries, Inc. Coating composition and process for preparing and applying the coating composition to glass fibers. 3,867,328, Cl. 260-29.300.
Falconer, John Paul Rutherford, to Midwest Housing Research Corporation. Structural framing system. 3,866,371, Cl. 52-281.000.
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Fanslow, Ronald J., to International Harvester Company. Mounting blocks in vehicle frame and method of installation therein. 3,866,939, Cl. 280-106.00R.
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Fauconnet, Michel, to Escher Wyss Limited. Reversible multi-stage hydraulic machine. 3,867,059, Cl. 415-153.000.
Federico, Armando: *See—*
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Feeny, Richard William, to American Cyanamid Company. 1,2-Dialkyl-3,5-diphenylpyrazolium salts. 3,867,403, Cl. 260-311.000.
Felber, Wilfried; and Morlock, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the manufacture of pulverizable thermosetting coating agents. 3,867,347, Cl. 260-63.0UY.
Felder, Ernst; Pitre, Davide; and Zutter, Hans, to Bracco Industria Chimica Societa per Azioni. Contrast agent for angiography and urography. 3,867,431, Cl. 260-501.110.
Feldkamper, Richard, to Windmoller & Holscher. Actuating apparatus for a diverter for sheet articles. 3,866,902, Cl. 271-64.000.
Fell, Ferol S.; Long, William D.; and McMillen, Kenneth R., to Hesston Corporation. Severed crop handling mechanism for harvesters. 3,866,399, Cl. 56-98.000.
Fenyes, Joseph G. E., to Chevron Research Company. 1-(Polyhaloakylthio) indazoles as fungicidal and bactericidal agents. 3,867,540, Cl. 424-273.000.
Ferguson, Robert M.; and Komp, Richard J., to Xerox Corporation. Method for cleaning liquid developers. 3,867,170, Cl. 117-37.0LE.
Ferrari, Giorgio; and Casagrande, Cesare. Tranquilizing and anti-anxiety pharmaceutical compositions. 3,867,529, Cl. 424-244.000.
Fett, Gunter: *See—*
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Fischer, Ronald H.; Ciric, Julius; and Whyte, Thaddeus E., Jr., to Mobil Oil Corporation. Process for oil demetalation and desulfurization with cobalt-molybdenum impregnated magnesium aluminate spinel. 3,867,282, Cl. 208-216.000.

Fischer, Werner K.; and Jemec, Raoul, to Swiss Aluminium Ltd. Anchoring for an electrically conductive bar in a groove in an electrode made out of a carbon block. 3,867,562, Cl. 13-25.000.

Fish, Warren; and Sundquist, Arman, to Whirlpool Corporation. Vacuum cleaner switch mounting means. 3,866,868, Cl. 248-27.000.

Fishbaugh, Byron L.: *See—*
Ramsey, Ira E.; and Fishbaugh, Byron L., 3,867,595.

Fite, Wade L., to Extranuclear Laboratories, Inc. Methods and apparatus for spatial separation of AC and DC electrical fields with application to fringe fields in quadrupole mass filters. 3,867,632, Cl. 250-292.000.

Flamegas, S.A.: *See—*
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Flanigen, Edith Marie; and Grose, Robert William, to Union Carbide Corporation. Amorphous hydrocarbon conversion catalysts and process for preparing same. 3,867,305, Cl. 252-437.000.

Fleming, Robert W.: *See—*
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Flinchum, Harold C.: *See—*
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Flom, Leonard. Posterior chamber artificial intraocular lens. 3,866,249, Cl. 3-13.000.

Florian, John, to Mobil Oil Corporation. Garment shaper. 3,866,810, Cl. 223-98.000.

FMC Corporation: *See—*
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Block, Donald P., 3,866,402.
Knopka, William N., 3,866,405.
Weir, Stanley M., 3,866,768.

Fohl, Timothy, to GTE Sylvania Incorporated. Double chamber arc tube for high intensity discharge lamp. 3,867,660, Cl. 313-12.000.

Folds, Donald L., to United States of America, Navy. Solid ultrasonic lens doublet. 3,866,711, Cl. 181-176.000.

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Forbes, Hampton E., Jr. Vehicle window ventilator. 3,866,524, Cl. 98-2.130.

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Forgione, Peter Salvatore, to American Cyanamid Company. Lactate dehydrogenase test material. 3,867,259, Cl. 195-99.000.

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Formica Corporation: *See—*
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Forrester, Macquorn R., to Intoximeters, Inc. Breath sample tube and method of making it. 3,867,099, Cl. 23-259.000.

Forsey, Thomas, Jr., to Goodyear Tire & Rubber Company, The. Passenger conveyor. 3,866,538, Cl. 104-167.000.

Forsheda Ideutveckling AB: *See—*
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Forsythe, Alan K.; and Green, Charles J., to Environmental Sciences Corporation. Bone fracture compression device and method of usage. 3,866,607, Cl. 128-92.00R.

Foster, E. Gordon; Russell, Paul F.; and Vanderwater, Robert G., to Shell Oil Company. Ethylene oxide process. 3,867,113, Cl. 55-44.000.

Foulk, Frank M. Adjustable roofing platform. 3,866,715, Cl. 182-45.000.

Fournier, Yves, to Saint-Gobain Industries. Method and apparatus for support of sheet material. 3,866,875, Cl. 248-363.000.

Fowler, Knobbe & Martens: *See—*
Webb, Albert A.; and Tullis, James Paul, 3,866,630.

Fox, Cyril, to British Ropes Limited. Rope fitting. 3,867,046, Cl. 403-210.000.

Fox, Daniel W., to General Electric Company. Flame retardant thermoplastic compositions. 3,867,336, Cl. 260-45.70R.

Frank, Karl; Frank, Martin A.; and Tschentscher, Dieter, to Burger Eisenwerke Aktiengesellschaft, Firma. Cooling container. 3,866,435, Cl. 62-382.000.

Frank, Karl; and Frank, Martin A., to Burger Eisenwerke Aktiengesellschaft, Firma. Cooling container. 3,866,436, Cl. 62-382.000.

Frank, Martin A.: *See—*
Frank, Karl; Frank, Martin A.; and Tschentscher, Dieter, 3,866,435.
Frank, Karl; and Frank, Martin A., 3,866,436.

Frank, Rudolf; Reuner, Horst; and Ulm, Klaus, to Hoechst Aktiengesellschaft. Process for the manufacture of flowable pasty detergents capable of being pumped. 3,867,316, Cl. 252-545.000.

Frank, Victor S.; Lard, Edwin W.; and Stahly, Eldon E., to W. R. Grace & Co. Burn-resistant plastic compositions. 3,867,344, Cl. 260-47.0EN.

Franklin, Samuel H. Hydraulic load indicator. 3,866,464, Cl. 73-141.00R.

Fraudin, Claude J., to Centre d'Etudes et de Recherches de la Machine Outil. Surface stress measuring apparatus. 3,866,462, Cl. 73-88.50R.

Freedman, David; and Sadir, Richardo, to New Brunswick Scientific Co., Inc. Mass transfer condenser, particularly for use with fermenting vessels. 3,867,260, Cl. 202-185.00E.

Freeman Chemical Corporation: *See—*
Plant, William J.; and Szwarc, John J., 3,867,222.

Freeman, Richard, to Coleco Industries, Inc. Automatic pinsetting bowling game. 3,866,691, Cl. 273-44.000.

Freese, Gary P.; and Sarff, Ronald E., to Caterpillar Tractor Company. Anti-kink and rollback device for elevating scrapers. 3,866,742, Cl. 198-175.000.

Freitag, David B.: *See—*
Herron, Roger G.; and Freitag, David B., 3,867,567.

French, Hollis E.; Herbine, Stanley C.; and McLeod, Gerald L., to Itek Corporation. Optical viewpoint. 3,867,235, Cl. 161-2.000.

French, Joseph W., to United States Steel Corporation. Wiper and diaphragm seal device. 3,866,924, Cl. 277-59.000.

French Oil Mill Machinery Company, The: *See—*
Barns, Roy W., 3,867,416.

Frequency Sources, Inc.: *See—*
Gili, Paul E., 3,867,706.

Fricke, Hans-Jurgen: *See—*
Kersten, Gunter; Fricke, Hans-Jurgen; and Veil, Karl, 3,866,421.

Fricko, John J., to General Motors Corporation. Vehicle occupant restraint belt system with comfort clip assembly. 3,866,975, Cl. 297-388.000.

Fried, E. Victor: *See—*
Porter, Carl D., 3,867,078.

Fried, John H.: *See—*
Alvarez, Francisco S.; Kluge, Arthur F.; and Fried, John H., 3,867,375.
Kluge, Arthur F.; Untch, Karl G.; and Fried, John H., 3,867,377.
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,867,407.

Friedman, Mendel: *See—*
Koenig, Nathan H.; and Friedman, Mendel, 3,867,095.

Friedman, Robert H., to Getty Oil Company. Methods for selective plugging. 3,866,684, Cl. 166-294.000.

Friedman, Robert H., to Getty Oil Company. Methods for selective plugging. 3,866,685, Cl. 166-294.000.

Friedrich Deckel Atiengesellschaft: *See—*
Muller, Johann, deceased, 3,867,054.

Fringeli, Werner: *See—*
Guenter, Franz; Fringeli, Werner; and Liechti, Peter, 3,867,376.

Frisoli, David M. Semi-automatic piston employing a pivotally, slideable member. 3,866,516, Cl. 89-190.000.

Frisque, Alvin J., to Nalco Chemical Company. Brines containing water-soluble anionic vinyl addition polymer and water soluble cationic polymer. 3,867,330, Cl. 260-29.6NR.

Fritzschz, Harold L., to General Electric Company. Masking apparatus for use in coating an article of manufacture. 3,866,567, Cl. 118-69.000.

Frost, William B.; and Cooper, Edward N. K. Indicia display panel. 3,866,343, Cl. 40-64.00R.

Fryer, Rodney Ian: *See—*
Earley, James Valentine; Fryer, Rodney Ian; and Walser, Armin, 3,867,370.

Fuchs, John R., to General Motors Corporation. Torque-loading device. 3,866,481, Cl. 74-89.150.

Fuji Photo Film Co., Ltd.: *See—*
Imai, Shinichi; and Sano, Kazuya, 3,867,458.
Iwano, Haruhiko; and Matsushita, Sachio, 3,867,419.
Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; Moriuchi, Shigenori; Sato, Akira; and Ikeda, Tadashi, 3,867,146.
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Yamada, Yoshihiko; and Makino, Katsuo, 3,867,139.

Fujii, Akio: *See—*
Umezawa, Hamao; Takahashi, Yasushi; Shirai, Tadashi; and Fujii, Akio, 3,867,257.

Fujimoto, Yasuo; and Nakamizo, Nobuhiro, to Kyowa Hakko Kogyo Co., Ltd. Method for preparing acylated products. 3,867,424, Cl. 260-471.00C.

Fujimura, Hajime; Suzuki, Kenju; Asano, Osamu; and Asai, Masaru, to Sanwa Kagaku Kenkyusho Co. Ltd. N-acyl-N'-substituted-2,6-diamino-benzoic acids and process for making the same. 3,867,437, Cl. 260-518.00R.

Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, to Toyo Boseki Kabushiki Kaisha. Polyester powder coating composition. 3,867,480, Cl. 260-873.000.

Fukui, Takasuke: *See—*
Oshima, Shintaro; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shinzuo, 3,867,690.

Fukumoto, Kenichi; and Nakamura, Ryuji, to Shikoku Kaken Kogyo Kabushiki Kaisha. Process for manufacturing granular foamed products of silica. 3,867,156, Cl. 106-40.00V.

Fukumoto, Ryoichi: *See—*
Suzuki, Toshio; Terada, Takami; Fukumoto, Ryoichi; and Matsumoto, Hisao, 3,866,270.

Fuller, Richard Buckminster. Non-symmetrical tension-integrity structures. 3,866,366, Cl. 52-81.000.

Furihata, Hiroyuki, to Olympus Optical Co., Ltd. Endoscope camera with orientation indicator. 3,866,602, Cl. 128-6.000.

Furmidge, Kenneth Frederick; and Beeson, Eric John George, to Thorn Electrical Industries Limited. Mercury discharge lamp comprising magnesium halide. 3,867,665, Cl. 313-485.000.

Furuuchi, Shigemasa: *See—*
Iida, Shuichi; Hayashi, Takao; Noguchi, Satoshi; and Furuuchi, Shigemasa, 3,867,015.

Furuya, Tetsuo; Ishikawa, Hidehiko; and Kanisawa, Hideo, to Konishiroku Photo Industry Co., Ltd. Fogged, direct-positive silver halide photographic material containing a rhodium salt desensitizer and a bispyrazolone dye stabilizer. 3,867,149, Cl. 96-101.000.

G & D Tool Company, Inc.: *See—*
Gregg, Jack C.; and White, Max D., 3,866,299.

G. L. Rexroth GmbH: *See—*
Appel, Wilhelm, 3,866,420.

G. T. Schjeldahl Company: *See—*
Gal, Carl G., 3,866,503.

Gabuev, Georgy Kharitonovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.

Gadsby, Brian: *See—*
Cross, Peter Edward; and Gadsby, Brian, 3,867,390.

Gagne, Roger A.: *See—*
Alesi, Anthony L.; Stimpert, Verne E.; and Gagne, Roger A., 3,867,239.

Gagneux, Andre: *See—*
Allgeier, Hans; and Gagneux, Andre, 3,867,536.

Gagnon, David P., to Sippican Corporation, The. Fishing tackle. 3,866,345, Cl. 43-4.000.

Gal, Carl G., to G. T. Schjeldahl Company. Reciprocatory drive means for treatment of movable webs. 3,866,503, Cl. 83-626.000.

Galasso, Francis S.; and Veltri, Richard D., to United Aircraft Corporation. Carbon-boron surfaced carbon filament. 3,867,191, Cl. 117-169.00R.

Galin, Walter E.: *See—*
Skarbo, Roald R.; Galin, Walter E.; and Natwig, David L., 3,867,506.

Gambardella, Mario A.; and Natoli, Frank S., to Olin Corporation. Flame retardant densified polyurethane foam. 3,867,320, Cl. 260-2.5AJ.

Ganz, Robert H. Method and apparatus for making a shrink pack. 3,866,386, Cl. 53-14.000.

Garden, William David, to Imperial Chemical Industries Limited. Catalysts and use thereof. 3,867,343, Cl. 260-46.5UA.

Gardiner, Robert A., to Crompton & Knowles Corporation. Extruder and temperature control apparatus therefor. 3,866,669, Cl. 165-27.000.

Gardner, Dan J. Two deck sport trailer. 3,866,772, Cl. 214-85.100.

Garner, Lloyd L., to Smith International, Inc. Drill bit with laminated friction bearing. 3,866,987, Cl. 308-8.200.

Garrett Corporation, The: *See—*
Elkins, Paul A.; Miller, Ralph A.; and Scheer, Lawrence E., 3,866,734.

Garrett, Roy Peter; Parkins, Derek Ray; and Kiener, Heinz, to SKF Industrial Trading and Development Company B.V. Hydraulic release mechanism for clutches. 3,866,732, Cl. 192-110.00B.

Garrison, Jerome R.: *See—*
Staranick, Steve; and Garrison, Jerome R., 3,866,777.

Gartland, Albert J., Jr., to Harvey Hubbell Incorporated. Contact spring. 3,867,008, Cl. 339-258.00R.

Gasser, William James, to Brite-O-Matic Manufacturing Inc. Wheel guard and travel stop arrangement. 3,866,539, Cl. 104-249.000.

Gasser, William James, to Brite-O-Matic Manufacturing Inc. Cable carrier. 3,867,590, Cl. 191-12.00R.

Gates Rubber Company, The: *See—*
Cone, Irwin C., 3,866,260.
Schaffer, William G., 3,866,632.

Gealt, Arthur E., to Honeywell Inc. Servo gain control of liquid conductivity meter. 3,867,687, Cl. 324-30.00R.

Gebelius, Sven Runo Vilhelm. Convectors and to system employing same. 3,866,671, Cl. 165-50.000.

Gebhart, Howard C.: *See—*
Wightman, Lawrance W.; Gebhart, Howard C.; and Tichy, Nick, 3,867,047.

Gebr. Bohler & Co. AG: *See—*
Marchard, Gustav, 3,866,491.

Gebrueder Buehler AG: *See—*
Linzberger, Robert, 3,866,842.

Geier, Georg; and Klatt, Alfred, to WABCO Westinghouse GmbH. Failsafe antiskid control for fluid pressure brake system. 3,866,982, Cl. 303-21.00F.

Geiger, Friedhelm; Lussling, Theodor; and Igert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the purification of sulfur and nitrogen containing waste water and waste gas. 3,867,509, Cl. 423-224.000.

Geil, Fred G., to United States of America, Navy. Underwater communications system. 3,867,715, Cl. 340-5.00T.

Geisler, Martin J.: *See—*
Driver, Michael C.; and Geisler, Martin J., 3,866,310.

Gelbin, Anatoly Nikolaevvich: *See—*
Krasik, Yakov Lvovich; Rappoport, Leonid Iosifovich; Gelbin, Anatoly Nikolaevvich; Marsjuk, Nikolai Andreevich; Gura, Anatoly Nikitovich; and Kirichenko, Boris Mefodievich, 3,867,669.

General Electric Company: *See—*
Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William Russell, 3,866,661.
Bishop, Larry D.; and Smith, William R., 3,867,681.
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Huber, Thomas R., 3,867,060.
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General Instrument Corporation: *See—*
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General Motors Corporation: *See—*
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General Tire & Rubber Company, The: *See—*
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Georgetown Steel Corp.: *See—*
Paletzki, Hans Joachim, 3,866,762.

Gerber, Gary A.: *See—*
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Gerber, Jean-Pierre, to Zenith Time S.A. Timepiece setting mechanism. 3,866,408, Cl. 58-63.000.

German, Roman Anatolievich: *See—*
Rutkevich, Zinovy Yakovlevich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and German, Roman Anatolievich, 3,866,634.

Germershausen, Raimund; Schmitt, Jochen; and Witt, Wolfram, to Rheinmetall GmbH. Apparatus for the electrical igniting of liquid propellents. 3,867,089, Cl. 431-263.000.

Gerstel, Arnold W.; and Meyers, Karel G. L., to Litton Systems, Inc. Working method for homogenizing particle material. 3,866,885, Cl. 259-3.000.

Gertsch AG: *See—*
Gertsch, Ernst; and Gertsch, Ulrich, 3,866,928.

Gertsch, Ernst; and Gertsch, Ulrich, to Gertsch AG. Safety ski binding. 3,866,928, Cl. 280-11.35K.

Gertsch, Ulrich: *See—*
Gertsch, Ernst; and Gertsch, Ulrich, 3,866,928.

Geschwender, Robert C., to Lancaster Research and Development Corporation. Method and apparatus for forming bulk containers from articulatable composite panels. 3,866,523, Cl. 93-58.0ST.

Geschwender, Robert C., to Lancaster Research and Development Corporation. Lightweight foldable furniture piece and method of constructing. 3,866,550, Cl. 108-153.000.

Gesing, Horst; Schimmer, Rigobert; and Streit, Manfred, to Licentia Patent-Verwaltungs-G.m.b.H. Method for producing semiconductor devices. 3,867,203, Cl. 148-187.000.

Getty Oil Company: *See—*
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Gewerkschaft Eisenhutte Westfalia: *See—*
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Gewfrtz, Harry R.; and Kellems, Kenneth K., to Acme General Corporation. Illuminated header. 3,867,621, Cl. 240-2.00R.

Gib Precision Limited: *See—*
Orwin, Olaf John Barclay, 3,866,728.

Gibson, Ronald Matley; and Gordon, Robin, to Electric Power Storage Limited. Pasting machines for storage battery plate grids. 3,866,569, Cl. 118-249.000.

Giichi Okuno: *See—*
Maekawa, Hiroshi; and Yamauchi, Choji, 3,867,174.

Gilbert, Jack J., to Photovolt Corporation. Automatic electrometric analysis. 3,867,273, Cl. 204-195.00R.

Gilbert, Richard L.; Hamilton, John G.; and Hasegawa, Tatsuo, to International Business Machines Corporation. Electrical print impression control. 3,866,533, Cl. 101-93.00C.

Gili, Paul E., to Frequency Sources, Inc. Frequency control and stabilization means and frequency discriminator. 3,867,706, Cl. 329-112.000.

Gili, Ricardo Aguirre, to Flamegas, S.A. Refillable gas cigarette lighter. 3,867,090, Cl. 431-277.000.

Gill, Charles L., to Harris, Beach & Wilcox; and Pelino, Angel, a part interest to each. Method for producing a lens blocking tool. 3,866,660, Cl. 164-108.000.

Gillette Company, The: *See—*
Nowak, Herman P., 3,866,298.

Giner, Jose: *See—*
Dunlop, James D.; Giner, Jose; Van Ommering, Gerrit; and Stockel, Joseph F., 3,867,199.

Ginsberg, Howard S.; and Hooper, Charles K., to Westinghouse Electric Corporation. Pulse forming network charging control system. 3,867,684, Cl. 321-19.000.

Gladky, Dmitry Fedorovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.

Glassmaster Company Limited: *See—*
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Gleason Works, The: *See—*
Deprez, Thomas A., 3,867,077.

Gleim, William K. T.; and O'Hara, Mark J., to Universal Oil Products Company. Coal liquefaction process. 3,867,275, Cl. 208-8.000.

Gleim, William K. T.; and Bremanis, Elmars, to Universal Oil Products Company. Vanadyl xanthates. 3,867,417, Cl. 260-429.00K.

Glendenning, Don M.; and Bledstein, Louis, to Arvin Industries, Inc. Tube shear machine. 3,866,501, Cl. 83-382.000.

Gluckin, Lawrence, to Griffin Industries Inc. Brassiere. 3,866,617, Cl. 128-484.000.

Godtfredsen, Wagn Ole: *See—*
Daehne, Welf Von; and Godtfredsen, Wagn Ole, 3,867,413.

Goebel, Henry R., to Western Kraft Corporation. Flared produce carton with corner cut-outs. 3,866,819, Cl. 229-30.000.

Goebel, Joseph: *See—*
Raterman, Donald E.; and Goebel, Joseph, 3,867,025.

Goeke, Alfons, to Th. Kieserling & Albrecht. Method and apparatus for shaving elongated workpieces. 3,866,495, Cl. 82-1.00C.

Gogerty, John H.: *See—*
Boyajy, Louis D.; and Gogerty, John H., 3,867,532.

Gold, Harold. Fluid tight conduit fastening system. 3,866,958, Cl. 285-334.200.

Goldbarb, Adolph E.: *See—*
Goldfarb, Adolph E.; Strader, George C.; and Strader, Judy D. (said Strader and Strader assors. to), 3,866,911.

Golden, Robert. Radiation beam constancy check block. 3,867,638, Cl. 250-505.000.

Goldfarb, Adolph E.; Benkoe, Erwin; and Libby, Erin, to said Benkoe, by said Goldfarb. Soft doll construction. 3,866,350, Cl. 46-161.000.

Goldfarb, Adolph E.; Strader, George C.; and Strader, Judy D., to Goldbarb, Adolph E., by said Strader and Strader. Game apparatus with rotating striker means. 3,866,911, Cl. 273-1.00R.

Goldfarb, Adolph E.; and Benkoe, Erwin. Playpiece and base member selectively interengagable to actuate effect means. 3,866,920, Cl. 273-138.00A.

Goldfarb, Adolph E. High-stability wheeled push device. 3,866,937, Cl. 280-47.380.

Goldfarb, Adolph E.: *See—*
Goldfarb, Adolph Eddy; and Dekan, Howard L., 3,866,918.

Goldfarb, Adolph Eddy; and Dekan, Howard L., to Goldfarb, Adolph E. Piece alignment game with overlying members. 3,866,918, Cl. 273-135.0AC.

Golm, Gunter G.; and Pitts, Thomas Edgar, to Leesona Corporation. Method and apparatus for the concurrent stripping of bobbins. 3,866,278, Cl. 28-19.000.

Gomberg, Edward N. Flat free pneumatic tire and void free filling therefor. 3,866,651, Cl. 152-313.000.

Goodfellow, Donald M.: *See—*
O'Connor, James M.; Nelson, Raymond A.; and Hunter, Gary L., 3,866,541.

Goodsell, Earl M., Jr.; and Vorkapich, Theodore, to American La France Inc. Fusible link for fire sprinklers. 3,866,686, Cl. 169-39.000.

Goodyear Aerospace Corporation: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
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Goppinger, Alois: *See—*
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Gordon, Bernard M.; Becker, Brant W.; and Prescott, Charles, to Gordon Engineering Company. Method of making a panel meter construction. 3,866,302, Cl. 29-417.000.

Gordon Engineering Company: *See—*
Gordon, Bernard M.; Becker, Brant W.; and Prescott, Charles, 3,866,302.

Gordon, Robin: *See—*
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Gordon Sherritt Mines Limited: *See—*
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Gorham, Michael L.: *See—*
Torpie, John D.; Bell, Allan J.; Gorham, Michael L.; and Keating, Walter G., 3,867,702.

Gorka, Andrew J., Jr., to United States of America, Atomic Energy Commission. Magazine for handling stripping foils in a particle accelerator. 3,867,704, Cl. 328-233.000.

Gorkovenko, Boris Konstantinovich; Mikhailovsky, Alexandr Mikhailovich; Churilova, Valentina Dmitrievna; and Kirillova, Olga Georgievna. Gas analyzer detector. 3,867,098, Cl. 23-254.00E.

Gorling, Karl Goran, to Boliden Aktiebolag. Method of agglomerating particulate material. 3,867,490, Cl. 264-24.000.

Gorman, Gerald W. Sealing rod wiper. 3,866,923, Cl. 277-24.000.

Gottwald, Anthony: *See—*
Gottwald, Otto; and Gottwald, Anthony, 3,866,596.

Gottwald, Otto; and Gottwald, Anthony. Heat control for catalytic heaters. 3,866,596, Cl. 126-208.000.

Gotz Metallbau GmbH: *See—*
Jacob, Gernot, 3,866,355.

Gotze, Christian; and Hujer, Friedrich, to Agfa-Gevaert Aktiengesellschaft. Mounting arrangement. 3,866,864, Cl. 248-1.000.

Goudie, John Willard; and Zukowski, Raymond Lewis. Apparatus for aligning image with blind spot of eye. 3,866,907, Cl. 272-8.00R.

Gould, David E., to Morgan Construction Company. Multi-groove roll mounting. 3,866,283, Cl. 29-121.00R.

Graafsma, Richard S., to Auto Specialties Manufacturing Company. Jack housing. 3,866,881, Cl. 254-1.000.

Graf, Paul E.; and Pimentel, Daniel R., to Texas Instruments Incorporated. Pressure sensitive switch with diaphragm and dish contact means. 3,867,594, Cl. 200-83.00P.

Graff, Kenneth R.: *See—*
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Grammatica, Steven James: *See—*
Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, 3,867,141.

Granger, Ernest R., to Granger, Richard R.; and Granger, Robert K. Dental face bow and method of using same. 3,866,323, Cl. 32-14.00D.

Granger, Richard R.: *See—*
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Granger, Robert K.: *See—*
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Grant, Frank A.: *See—*
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Grant, Munro M. Shoulder pad cushion. 3,866,241, Cl. 2-2.000.

Grasso, Charles Paul: *See—*
Cross, Barrington; and Grasso, Charles Paul, 3,867,429.

Gratton, Charles Peter; Hoper, Alan Thomas; and Kenward, Alan, to United Kingdom Atomic Energy Authority. Nuclear reactors. 3,867,253, Cl. 176-40.000.

Gratty, William, to William Boulton Limited. Decoration of ceramic ware. 3,867,220, Cl. 156-73.000.

Grayson, Robert E. Rural mailbox signal. 3,866,823, Cl. 232-35.000.

Greathead, Thomas William, to Post Office, The. Method of feeding discrete articles from a storage location and a machine therefor. 3,866,740, Cl. 198-34.000.

Green, Charles J.: *See—*
Forsythe, Alan K.; and Green, Charles J., 3,866,607.

Green Island International, Inc.: *See—*
Cobia, Barnell L., 3,866,351.

Green, John R. Safety cover for a bumper hitch. 3,866,949, Cl. 280-507.000.

Greenberg, Albert J. Controlled expansion projectile. 3,866,536, Cl. 102-91.000.

Greene, George J., Jr., to Greene Research Engineering, Co. Porportioning pump. 3,866,621, Cl. 137-99.000.

Greene Research Engineering, Co.: *See*—
Greene, George J., Jr., 3,866,621.

Greenfield, Harold: *See*—
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Greenfield, Stanley A.: *See*—
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Greenhood, Robert M.: *See*—
Bullock, Joseph John; and Greenhood, Robert M., 3,866,783.

Greenwood, Alan, to Goodyear Tire & Rubber Company, The. Method of operating a fire mold. 3,867,504, Cl. 264-326.000.

Gregg, Jack C.; and White, Max D., to G & D Tool Company, Inc. Seal assembly tool. 3,866,299, Cl. 29-235.000.

Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich. Method for producing annular forgings. 3,867,208, Cl. 148-11.50R.

Greutter, Wilfried, to Inventio AG. Load-dependent braking device for conveying systems. 3,866,725, Cl. 188-134.000.

Griffin Industries Inc.: *See*—
Gluckin, Lawrence, 3,866,617.

Griffiths, Robert I.: *See*—
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Grimm, John G., Jr.: *See*—
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Grolet, Pierre: *See*—
Willm, Yves; Thiery, Jean; Chatard, Michel; and Grolet, Pierre, 3,866,882.

Gronda, Delso. Machine for perforating and for binding sheets into a plastic ring folder. 3,866,254, Cl. 11-1.0AC.

Gros-Tte Industries, Inc.: *See*—
Everett, George, 3,867,081.

Grose, Robert William: *See*—
Flanigen, Edith Marie; and Grose, Robert William, 3,867,305.

Grosheim, Gene Edward: *See*—
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Grozhan, Mark Markovich; Kamzolkin, Vladimir Vasilievich; Lapitsky, Jury Anatolievich; and Bashkirov, Andrei Nikolaevich. Method of producing alkanoic acid esters of alpha-phenylethyl alcohol. 3,867,430, Cl. 260-488.0CD.

Grujanac, Peter; and Huntington, Clyde L., to Lakeside Equipment Corporation. Screw pump. 3,867,057, Cl. 415-72.000.

Grunberg, Emanuel; and Hoffer, Max, to Hoffmann-La Roche Inc. 2,4-Diamino-5-(3-alkoxy-4,5-methylenedioxybenzyl)pyrimidine. 3,867,527, Cl. 424-229.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Christenson, Gerald A., 3,867,648.
Herron, Roger G.; and Freitag, David B., 3,867,567.
Michalak, Bogumil M.; and Bertellotti, Ansano, 3,867,000.
Morstadt, Richard A., 3,867,585.
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GTE Sylvania Incorporated: *See*—
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Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, 3,866,980.

Guarino, Michael C.; and Cacossa, Frank, to M. C. Guarino Associates, Inc. Adjustable modular Partition. 3,866,370, Cl. 52-241.000.

Guenter, Franz; Fringeli, Werner; and Liechti, Peter, to Ciba-Geigy AG. Bis-s-triazin ylamino-stilbene-2,2-disulphonic acids. 3,867,376, Cl. 260-240.00B.

Guido, Joseph J.; and Anderson, James R., to National Packaging Corporation. Method for sealing plastic bags. 3,867,226, Cl. 156-229.000.

Guidry, Hanson Lee: *See*—
Elliott, Curtis H., Jr.; and Guidry, Hanson Lee, 3,867,310.

Guillory, Jack P.; Becker, Ralph S.; and Hughes, William B., to Phillips Petroleum Company. Ultraviolet stabilized polyolefins. 3,867,342, Cl. 260-45.85S.

Gulf & Western Industries, Inc.: *See*—
White, Robert R., 3,867,614.

Gundlach, Robert W., to Xerox Corporation. Foraminous electrostatographic transfer system. 3,866,572, Cl. 118-637.000.

Gura, Anatoly Nikitovich: *See*—
Krasik, Yakov Lvovich; Rappoport, Leonid Iosifovich; Gelbin, Anatoly Nikolaevvich; Marsjuk, Nikolai Andreevich; .Gura, Anatoly Nikitovich; and Kirichenko, Boris Mefodievich, 3,867,669.

Gutjahr, Paul. Machine for automatic stringing or collaring of packages with plastic tape. 3,866,812, Cl. 226-50.000.

Gutzy, Klaus: *See*—
Soehnle, Karl; Scheerer, Richard; Gutzy, Klaus; Busse, Rido; and Rapp, Reinhold, 3,866,699.

Guyton, Floyd R. Stowable wall table. 3,866,547, Cl. 108-38.000.

H & H Licensing Corporation: *See*—
Spindler, Walter, 3,867,076.

Haage, Karl, to Dynamit Nobel Aktiengesellschaft. Mounting element and method for a loosely laid synthetic resin film and roof construction containing same. 3,866,372, Cl. 52-309.000.

Haas, Franz. Method for producing filled tubular waffles. 3,867,559, Cl. 426-283.000.

Haataja, Paavo: *See*—
Kantola, Mikko; and Haataja, Paavo, 3,866,639.

Habermeier, Jurgen; and Porret, Daniel, to Ciba-Geigy Corporation. Binuclear n-heterocyclic polyglycidyl compounds, processes for their manufacture, and their use. 3,867,385, Cl. 260-256.40C.

Habermeier, Jurgen; and Batzer, Hans, to Ciba-Geigy Corporation. Process for the manufacture of 1,1-methylene-bis-(3-(hydroxylalkyl)-hydantoins). 3,867,400, Cl. 260-309.500.

Haffenden, Walter J.: *See*—
Kawulka, Paul; Haffenden, Walter J.; and Mackiw, Vladimir N., 3,867,268.

Haga, Tsunehiro: *See*—
Kasuga, Kesaharu; Abe, Takeo; and Haga, Tsunehiro, 3,867,119.

Haglund, Ulf Karl Henrik, to Rockwool Aktiebolaget. Laminar disc of mineral wool. 3,867,241, Cl. 161-42.000.

Hakanson, Nils L., to Scott Paper Company. Method and apparatus for assuring contact between thin sheets of material. 3,867,031, Cl. 355-78.000.

Halasz, Istvan; Asshauer, Jurgen; Endele, Richard; and De Haas, Klaus, to said Halasz, by said Asshauer, Endele and De Haas. Method of making a column for chromatography. 3,866,308, Cl. 29-527.400.

Halasz, Istvan: *See*—
Halasz, Istvan; Asshauer, Jurgen; Endele, Richard; and De Haas, Klaus (assors. to said Halasz, by said Asshauer, Endele and De Haas), 3,866,308.

Halcon International, Inc.: *See*—
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Haldex Aktiebolog: *See*—
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Hall, James A.: *See*—
Pering, Richard D.; and Hall, James A., 3,867,707.

Halpern, Benjamin D.; and Akkapeddi, Murali Krishna, to Polysciences, Inc. Composition for a hydrogel dilator article of manufacture and method for making same. 3,867,329, Cl. 260-29.60H.

Hamada, Takao: *See*—
Endou, Akira; Maeda, Masao; Okumichi, Toshiharu; Nakayasu, Teruo; and Hamada, Takao, 3,867,466.

Hamby, Robert L. Holster safety clasp. 3,866,811, Cl. 224-2.00B.

Hamilton, Earl F., Jr. Dispensing apparatus with a trap chamber pulverulent. 3,866,805, Cl. 222-427.000.

Hamilton, John G.: *See*—
Gilbert, Richard L.; Hamilton, John G.; and Hasegawa, Tatsuo, 3,866,533.

Hamilton, Joseph R., to Lynch Corporation. Mold operating mechanism. 3,867,123, Cl. 65-359.000.

Hamlet, Buck C.: *See*—
Sweet, Phillip J.; Hamlet, Buck C.; and Sweet, David L., 3,866,894.

Hamm, Philip C.: *See*—
Olin, John F.; and Hamm, Philip C., 3,867,426.

Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schuierer, Erich, to Kalle Aktiengesellschaft. Tubular casing of cellulose hydrate with a fat and water repellent inner surface and process for the manufacture thereof. 3,867,182, Cl. 117-95.000.

Hancock, James Thomas, Jr. Process for producing high specific gravity material from low grade iron ore. 3,867,128, Cl. 75-1.000.

Hangler, Frank X. Bicycle conversion stand. 3,866,908, Cl. 272-73.000.

Hansen, Hans John. Carcinoembryonic antigens. 3,867,363, Cl. 260-112.00R.

Hansen, Hans John: *See*—
Coffey, John William; and Hansen, Hans John, 3,867,518.

Hansen, Loren F., to Koehring Company. Field cultivator wing lift. 3,866,688, Cl. 172-311.000.

Hansen Manufacturing Company, The: *See*—
Norton, James F., 3,866,957.

Hanson, Fred H.: *See*—
Webb, Albert A.; and Tullis, James Paul, 3,866,630.

Hansson, Hans Olof, to Telefonaktiebolaget L M Ericsson. Process for electroplating an aluminum wire. 3,867,265, Cl. 204-28.000.

Hapke, Kenyon A.: *See*—
Mueller, Arthur C.; and Hapke, Kenyon A., 3,867,021.

Hardennrook, James M.; and Andrus, Paul G., to Xerox Corporation. Xerographic developing apparatus. 3,866,574, Cl. 118-637.000.

Hargest, Thomas S. Cyclically produced contoured support. 3,866,606, Cl. 128-71.000.

Harkrider, John. Vehicle headlight de-filming device. 3,866,840, Cl. 240-7.10R.

Harper, John: *See*—
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Wolfberg, Larry B.; and Harper, John, 3,866,500.

Harris, Beach & Wilcox: *See*—
Gill, Charles L., 3,866,660.

Harris, Roger Lawrence Newton; and Spaun, Rudiger, to Ciba-Geigy Corporation. Thiadiazolium salts as antihelmintic agents. 3,867,535, Cl. 424-263.000.

Harrison, Donald I., to Cryo-Chem, Inc. Helical conveyor heat exchange system. 3,866,432, Cl. 62-208.000.

Harrison, Ian T.: *See*—
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Harry A. Peterson Company, Inc.: *See*—
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Harry M. Rubenstein: *See*—
Quaintance, Laythol W., 3,867,610.

Harthill, William P.; and Van Calcar, Henry, to Honeywell Inc. Adaptive filter. 3,867,712, Cl. 340-6.00R.

Hartley, David: *See*—
Atkinson, Michael; and Hartley, David, 3,867,455.

Hartley, Ezra D. Pumping system with air vent. 3,867,071, Cl. 417-211.500.

Hartmann & Braun Aktiengesellschaft: *See*—
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Hartmann & Braun-Mess-und Regeltechnik Aktiengesellschaft: *See*—
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Hartwig, Karl: *See*—
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Harvey Hubbell Incorporated: *See*—
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Hasegawa, Tatsuo: *See*—
Gilbert, Richard L.; Hamilton, John G.; and Hasegawa, Tatsuo, 3,866,533.

Hashimoto, Mitsuru, to Kabushiki Kaisha Ricoh. Organic photoconductor-(mononitro-2-aza-fluorenylidene)malononitrile charge transfer complex. 3,867,140, Cl. 96-1.500.

Hasinger, Siegfried H., to United States of America, Air Force. Multicomponent flow probe. 3,867,033, Cl. 356-103.000.

Hass, Robert H., to Union Oil Company of California. Exhaust gas conversion process and apparatus. 3,867,508, Cl. 423-213.700.

Hasselmann, Detlev E. M., to TRW Inc. Gas sample collecting device. 3,866,474, Cl. 73-421.50R.

Haubner, Georg; and Schmaldienst, Peter, to Robert Bosch G.m.b.H. Semiconductor controlled magneto ignition system for internal combustion engines. 3,866,589, Cl. 123-148.0MC.

Haugen, Haakon, to Texaco Inc. Sulfurized oligomeric phosphorodiamidate. 3,867,367, Cl. 260-125.000.

Hauke, Robert C.: *See*—
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Hauni-Werke Korber & Co., KG: *See*—
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Hawker Siddeley Aviation Limited: *See*—
Maynard, Harry; and Boot, Roy Desmond, 3,866,955.

Hayashi, Takao: *See*—
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Heap, James C., to Thrall Car Manufacturing Company. High side gondola car. 3,866,545, Cl. 105-406.000.

Hebbel, Gerhard; and Kruger, Horst, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Chlorine-free multiple step bleaching of cellulose. 3,867,246, Cl. 162-76.000.

Hebel, Ulrich: *See*—
Hebel, Walter; and Hebel, Ulrich, 3,866,326.

Hebel, Walter; and Hebel, Ulrich. Drawing board. 3,866,326, Cl. 33-76.00R.

Hedeen, James O.; and Ogren, Harvey D., to United States of America, Air Force. Fluidic free flight sensor. 3,866,535, Cl. 102-70.20G.

Hedges, James H. Trash cart. 3,866,936, Cl. 280-47.260.

Hedman, Robert W. Spark plug adapter and method of making. 3,867,001, Cl. 339-26.000.

Heeg, Rudolf; and Striebich, Alfred, to Davy-Ashmore Aktiengesellschaft. Addition of dimethyl terephthalate and ethylene glycol to recycled bis(hydroxyethyl)terephthalate. 3,867,349, Cl. 260-75.00M.

Heil, Roland Lee; and Mroczkiewicz, Albert John, to Miller Steel & Supply Company, Incorporated. Guardrail arrangement and method of installing. 3,866,884, Cl. 256-59.000.

Heilweil, Israel J.: *See*—
Schwab, Frederick C.; and Heilweil, Israel J., 3,867,295.

Heimberger, Werner; Schmitt, Hermann; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the purification and stabilization of malonodinitrile. 3,867,422, Cl. 260-465.80R.

Hein, Richard D.; and Fordyce, Gary L., to General Tire & Rubber Company, The. Elastomeric railroad crossing structure. 3,866,830, Cl. 238-8.000.

Heinrich, Ernst; and Muller, Rolf, to Cassela Farbwerke Mainkur Aktiengesellschaft. Hydroxy-pyridone-monosulfonic acids. 3,867,392, Cl. 260-294.80R.

Heintzelman, Leo A. Air water separator. 3,867,115, Cl. 55-218.000.

Heitmann, Uwe: *See*—
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Helfert, Herbert: *See*—
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Heller, Rudolf, to Contraves AG. Method for fabricating molded elements by bonding solid particles with a resin. 3,867,495, Cl. 264-51.000.

Hellma GmbH & Co.: *See*—
Mayer, Peter; and Sutor, Anton Heinz, 3,867,042.

Hendrickson, Ray V. Motion imparting apparatus. 3,867,058, Cl. 415-125.000.

Henkin, Robert I., to United States of America, Health, Education and Welfare. Method of producing anorexia as a treatment of obesity. 3,867,539, Cl. 424-273.000.

Hennart, Claude; Mandon, Jean-Pierre; Martin, Georges; and Rabussier, Bernard, to Ciba-Geigy AG. Stabilized compositions containing a phosphoric acid ester pesticide and an alcoholic compound. 3,867,526, Cl. 424-219.000.

Henry, Loic, to U.S. Philips Corporation. Method of etching a pattern in a silicon nitride layer. 3,867,218, Cl. 156-8.000.

Hensel, Jorg; Lussling, Theodor; Noll, Ewald; Schaefer, Hans; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the oxidation of $\alpha\beta$-unsaturated aldehydes to $\alpha\beta$-unsaturated carboxylic acids. 3,867,438, Cl. 260-530.00N.

Herbert, William B. Opposed piston engine. 3,866,581, Cl. 123-51.00B.

Herbine, Stanley C.: *See*—
French, Hollis E.; Herbine, Stanley C.; and McLeod, Gerald L., 3,867,235.

Hercules Incorporated: *See*—
Minke, Charles M., 3,866,792.

Herman, Clairmont J., to General Electric Company. Electrical insulation. 3,867,245, Cl. 161-143.000.

Herman, Roger Samuel, to Swiss Aluminium Ltd. Novel anode fitting. 3,867,274, Cl. 204-197.000.

Hermans, Theofiel Eveline; and Delzenne, Gerard Albert, to Agfa-Gevaert N.V. Electron beam recording. 3,867,192, Cl. 117-201.000.

Herring, Bernard D. Neck exercising device. 3,866,910, Cl. 272-180.000.

Herring, Desmond Edward, to American Home Products Corporation. Toilet cleansing device. 3,867,101, Cl. 23-267.00A.

Herring, Harold K.: *See*—
Sato, Kunito; and Herring, Harold K., 3,867,558.

Herrington, Donald. Automatic system for dialing a central taxicab dispatching station. 3,867,577, Cl. 179-2.00R.

Herrington, F. John, to Mobil Oil Corporation. Shape imposition apparatus for the extrusion of tubular thermoplastic film. 3,867,083, Cl. 425-326.00R.

Herron, Roger G.; and Freitag, David B., to GTE Automatic Electric Laboratories Incorporated. Electronic data terminal interface. 3,867,567, Cl. 178-3.000.

Hertz, Gerald, to Crompton & Knowles Corporation. Fluidized bed dryer. 3,866,332, Cl. 34-57.00A.

Herveling, Wilhelm; Birker, Alfred; Langefeld, Siegfried; Daimler, Berthold H.; Fett, Gunter; and Dickersbach, Irmgard, to Akzona Incorporated. Horticultural nonwoven substrate and side mat. 3,866,352, Cl. 47-34.000.

Hesston Corporation: *See*—
Fell, Ferol S.; Long, William D.; and McMillen, Kenneth R., 3,866,399.

Hester, Jackson B., Jr., to Upjohn Company, The. 2-(3-Aminopropyl)-2,4-dihydro-6-phenyl-1H-s-triazolo[4,3-a][1,4]benzodiazepin-1-ones and method of treatment therewith. 3,867,530, Cl. 424-248.000.

Heubeck, Erich, to Siemens Aktiengesellschaft. Dental patients chair with automatic actuation. 3,866,973, Cl. 297-316.000.

Heuser, Helmut; Stupp, Winfried; Penz, Heinz; Rose, Walter; and Muller, Siegfried, to Walter Rose KG. Apparatus for splicing conductors. 3,866,291, Cl. 29-203.0DS.

Hewlett-Packard Company: *See*—
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Pering, Richard D.; and Hall, James A., 3,867,707.

Hewson, John R., to Daigle, Claude W., a part interest. Portable electronic cardiac stimulator. 3,866,615, Cl. 128-419.00D.

Heyman Manufacturing Company: *See*—
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Hickok, Ray M.: *See*—
Warner, Ronald C.; Shepherd, Bobby R.; Hickok, Ray M.; and Alexander, Charles A., 3,866,393.

Hiergeist, Richard, to Mannesmann Leichtbau Gesellschaft mit beschrankter Haftung. Reeling of load and safety cables or ropes for cages suspended in front of buildings or the like. 3,866,718, Cl. 187-27.000.

Higgins, John J.: *See*—
O'Farrell, Charles P.; and Higgins, John J., 3,867,247.

Higgins, Philip M.: *See*—
Callahan, Bernard E.; and Higgins, Philip M., 3,867,647.

Hill, Maynard L. Method and apparatus for defining an equipotential plane in the electrostatic field in the atmosphere utilizing rotating potential sensing probes. 3,866,859, Cl. 244-77.00R.

Hillman, Edwin K. Wind powered motive apparatus. 3,867,067, Cl. 416-10.000.

Hills, David J., to Dow Chemical Company, The. Preparation of potassium benzolate. 3,867,439, Cl. 260-525.000.

Hills, William H.: *See*—
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Himmele, Walter: *See*—
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Hirabayashi, Kiyoteru: *See*—
Ohwa, Toshio; Taketomi, Kosaku; Tanaka, Osamu; Sakai, Bunshiro; Taira, Tadaaki; and Hirabayashi, Kiyoteru, 3,867,608.

Hirano, Takayoshi: *See*—
Murakami, Masuo; Kawata, Ryuichi; Kawamura, Shigeo; Takamura, Shuichi; Hirano, Takayoshi; and Tomuro, Kouji, 3,867,414.

Hirohashi, Toshiyuki: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Mori, Kazuo; Kume, Yoshiharu; and Izumi, Takahiro, 3,867,372.

Hirschmann, Alexandre, to Novel Hoechst Chimie. Cross-linking agent, cross-linking composition containing same, their production and their use in the textile industry. 3,867,348, Cl. 260-70.00R.

Hisata, Manabu: *See—*
Horiuchi, Takefumi; Monju, Yoshiyiki; Tatara, Isamu; Nagai, Nobuyuki; Hisata, Manabu; and Matsumoto, Kiyoshi, 3,867,209.

Hitachi, Ltd.: *See—*
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Hitze, Winfried; Legler, Karla; Stute, Rolf; and Woelk, Hans-Ulrich, to CPC International Inc. Process for reducing the boiling time of dehydrated peas. 3,867,553, Cl. 426-44.000.

Hobbs, Oliver K. Inclined endless screen belt with transverse bar. 3,866,752, Cl. 209-12.000.

Hoberman, Richard. Apparatus for desoldering scrap radiator cores and recovering separated metals. 3,866,893, Cl. 266-33.00S.,

Hoechst Aktiengesellschaft: *See—*
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Hoefer Scientific Instruments: *See—*
Hoefer, Stanton Albert, 3,867,271.

Hoefer, Stanton Albert, to Hoefer Scientific Instruments. Gel electrophoresis apparatus and method. 3,867,271, Cl. 204-180.00G.

Hoesch Aktiengesellschaft: *See—*
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Hoffer, Max: *See—*
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Hoffman, David C.: *See—*
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Hoffman-La Roche Inc.: *See—*
Earley, James Valentine; Fryer, Rodney Ian; and Walser, Armin, 3,867,370.

Hoffmann-La Roche Inc.: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,867,415.
Coffey, John William; and Hansen, Hans John, 3,867,518.
Grunberg, Emanuel; and Hoffer, Max, 3,867,527.
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,867,441.

Hoffmann, Werner; Himmele, Walter; and Aquila, Werner, to Basf Aktiengesellschaft. Production of penta-2,4-dien-1-als and related trienals. 3,867,459, Cl. 260-601.00R.

Hojyo, Iwajiro. Method of shrinking cloth or paper. 3,866,277, Cl. 26-18.600.

Hokkaido Sugar Co., Ltd.: *See—*
Narita, Shigeyoshi; Naganishi, Hirosuke; Izumi, Chikashi; Yokouchi, Akiyoshi; and Yamada, Masaru, 3,867,256.

Holden, Morell J., Jr., to Mobil Oil Corporation. Plastic packaging tray, particularly for bananas. 3,866,817, Cl. 229-15.000.

Holert, Donald C. Book with cassette holding recess. 3,866,751, Cl. 206-387.000.

Holladay, Jimmie L., to Coats Company, Inc., The. Tire changer with improved tire changing tool. 3,866,655, Cl. 157-1.240.

Holland, Gerald F., to Pfizer Inc. Cyclic n-substituted derivatives of 1,4-benzene disulphonamide. 3,867,391, Cl. 260-293.730.

Hollnagel, Harold S. Variable two-way shock absorber. 3,866,724, Cl. 188-129.000.

Holloway, Robert E.: *See—*
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Holman, Owen F. Density control for hay balers. 3,866,529, Cl. 100-43.000.

Holme, Gunnar K., to Angpanneforeningen. Combustion of alkaline cooking liquor. 3,867,251, Cl. 162-30.000.

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Holper, Frank, to Original Equipment Motors Inc. Resilient spheroidal bearing supports. 3,866,986, Cl. 308-72.000.

Holtzman, Joseph A. Luggage manufacture. 3,866,554, Cl. 112-262.000.

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Hombak Maschinenfabrik KG: *See—*
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Homeier, Howard A. Hot stick attachment. 3,866,965, Cl. 294-19.00R.

Honerkamp, Joseph D.; and Tournoux, Paul M., to Black, Sivalls & Bryson, Inc. Reconcentrating solute-rich liquid absorbent. 3,867,112, Cl. 55-32.000.

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Honigman, Michael L., to Elm Design, Inc. Expandable space enclosure including apparatus for erecting and retracting same. 3,856,365, Cl. 52-70.000.

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Hook, Edwin O.; Berbeco, George R.; and Obermayer, Arthur S., to Moleculon Research Corporation. Method of treating cellulosic material with N-methylol phosphazene compounds and product obtained. 3,867,186, Cl. 117-136.000.

Hooper, Charles Ernest. Laundry apparatus and method of laundering. 3,866,330, Cl. 34-8.000.

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Hopkins, John O., to Calumite Company, The. Silicate glass from blast furnace slag. 3,867,158, Cl. 106-51.000.

Hoppe, Paul Peter, Jr., to Bunker Ramo Corporation. Insulation-piercing contact member and electrical connector. 3,867,005, Cl. 339-98.000.

Horanoff, Eugene V., to United States of America, Navy. Wind tunnel model support and measuring system with three-degrees-of-freedom. 3,866,467, Cl. 73-147.000.

Horiuchi, Takefumi; Monju, Yoshiyiki; Tatara, Isamu; Nagai, Nobuyuki; Hisata, Manabu; and Matsumoto, Kiyoshi, to Kobe Steel, Ltd. A method of treating TI-NB-ZR-TA superconducting alloys. 3,867,209, Cl. 148-12.700.

Horn, James N.; and Hoffman, David C., to Industrial Nucleonics Corporation. Article classifying system and method. 3,867,283, Cl. 209-74.00M.

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Hornschuch, Hanns: *See—*
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Horst Power Systems, Inc.: *See—*
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Houlihan, William J., to Sandoz-Wander, Inc. 2-Morpholinomethylbenzophenone. 3,867,381, Cl. 260-247.70R.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Wander, Inc. Substituted p-(1-hydroxyalkyl) phenethyl alcohols. 3,867,465, Cl. 260-618.00R.

Hounsfield, Godfrey Newbold, to EMI Limited. Body portion support for use with penetrating radiation examination apparatus. 3,867,634, Cl. 250-360.000.

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Hsieh, Henry L.; Buck, Ollie G.; and Naylor, Floyd E., to Phillips Petroleum Company. Polymerization of oxiranes and lactones. 3,867,353, Cl. 260-78.30R.

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Huber, Thomas R., to General Electric Company. Shroud assembly. 3,867,060, Cl. 415-172.00A.

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Hudock, John S., to Westinghouse Electric Corporation. Pultruded shapes containing hollow glass or ceramic spheres. 3,866,373, Cl. 52-309.000.

Hudson, Ed D.; Lord, Richard S.; and Mallory, Merrit L., to United States of America, Atomic Energy Commission. Cyclotron internal ion source with dc extraction. 3,867,705, Cl. 328-234.000.

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Hutchins, Alma A. Method of piercing air suction holes in abrasive sheet material. 3,866,304, Cl. 29-445.000.
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Hutton, Leland H. Mobile personnel car for ingot pouring operations. 3,866,663, Cl. 164-155.000.
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Jacob, Adir. Process and material for manufacturing semiconductor devices. 3,867,216, Cl. 156-2.000.

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Jeffress, Ronald E., to General Electric Company. Appliance cord-connecting structure. 3,867,006, Cl. 339-103.00M.

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Johnson, Herbert G., to Upjohn Company, The. Dosage regimen. 3,867,534, Cl. 424-258.000.

Johnson, Tore Rudolf, to AMP Incorporated. Spark gap protective device for cathode ray tubes. 3,867,671, Cl. 317-61.500.

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Jones, Edward W., to Pioneer Laboratories, Inc. Gauze pad impregnation between belts. 3,866,566, Cl. 118-58.000.

Jones, Ferris E. Bench seat. 3,866,974, Cl. 297-353.000.

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Jones, Robert E. Heating accessory for use with fireplaces. 3,866,595, Cl. 126-121.000.

Jorgensen, Charles T. Hinged metal belt conveyor. 3,866,743, Cl. 198-195.000.

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Junek, Peter G., to Astrocom Division of Q.C.P. Ltd. Enhancing impedance characteristics of negative impedance repeaters operating at high gain. 3,867,589, Cl. 179-175.31R.

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Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.

Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, to Hoffmann-La Roche Inc. Nitro-substituted phenylthio dopamines. 3,867,441, Cl. 260-551.00S.

Kaiser Aerospace and Electronics Corporation: *See—*
Mingus, Ray E.; and Stuart, Ross M., 3,866,638.

Kalbfleisch, Fritz. Vacuum furnace equipment for heat treatment, hardening and brazing working parts. 3,866,891, Cl. 266-5.0El.

Kalle Aktiengesellschaft: *See—*
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Schuierer, Erich, 3,867,182.

Kaller Die & Tool Company: *See—*
Carroll, William M.; Aulis, Guntis M.; and Starr, Francis C., 3,866,471.

Kallrath, Gottfried: *See—*
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Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyme dite: L'Oreal. Dyeing keratinous fibers with dye compositions containing indoanilines. 3,867,094, Cl. 8-10.000.

Kalopissis, Gregoire; and Bugaut, Andree, to Societe Anonyme dite: L'Oreal. Mono-omega-haloalkyl amines. 3,867,456, Cl. 260-574.000.

Kamakura, Hiroshi: *See—*
Mitsui, Yoshihiro; and Kamakura, Hiroshi, 3,867,656.

Kaminski, Floyd. Drapery tie back device. 3,866,659, Cl. 160-349.00D.

Kamiuchi, Junichi: *See—*
Takechi, Taichi; Kumazawa, Ryozi; Umemoto, Kimikazu; Yamada, Toshimitsu; Kamiuchi, Junichi; and Koyanagi, Eiji, 3,866,316.

Kamzolkin, Vladimir Vasilievich: *See—*
Grozhan, Mark Markovich; Kamzolkin, Vladimir Vasilievich; Lapitsky, Jury Anatolievich; and Bashkirov, Andrei Nikolaevich, 3,867,430.

Kanetka, Junichi; and Shimodaira, Takashi, to Mitsubishi Petrochemimcal Co., Ltd. Process for preparing N-(beta-hydroxyethyl)-2-pyrrolidone. 3,867,405, Cl. 260-326.5FL.

Kanisawa, Hideo: *See—*
Furuya, Tetsuo; Ishikawa, Hidehiko; and Kanisawa, Hideo, 3,867,149.

Kano, Motomi: *See—*
Arikawa, Masayasu; Kano, Motomi; and Okuda, Naoki, 3,866,284.

Kansai Paint Co., Ltd.: *See—*
Juna, Kiyoshi; Ohdan, Koji; Nakayama, Hiroyuki; and Asada, Kiyohiko, 3,867,351.
Sagane, Masahiko, 3,867,016.

Kantola, Mikko; and Haataja, Paavo, to Tyotehoseura R. Y. Tree trimming and transporting machine. 3,866,639, Cl. 144-2.00Z.

Kappe Associates, Inc.: *See—*
Kappe, Stanley E.; and Kappe, David S., 3,867,284.

Kappe, David S.: *See—*
Kappe, Stanley E.; and Kappe, David S., 3,867,284.

Kappe, Stanley E.; and Kappe, David S., to Kappe Associates, Inc. Water treatment with nitrogen dioxide. 3,867,284, Cl. 210-15.000.

Karabinos, Joseph V.; and Andriole, Vincent T., to Carbolabs, Inc. Bactericidal composition. 3,867,300, Cl. 252-106.000.

Kardashian, Vahram S., to Honeywell Inc. Dual wire intruder detector. 3,867,564, Cl. 174-36.000.

Karmel, Paul R.; Toth, William E.; and Trageser, Milton B., to United States of America, Air Force. Method of changing a phase difference in an input pulse to a pulse rate. 3,867,701, Cl. 328-134.000.

Kasahara, Mikio; and Sato, Yozo, to Kawasaki Jukogyo Kabushiki Kaisha. Open circuit breathing apparatus. 3,866,622, Cl. 137-102.000.

Kasimova, Adilya Khanum Panakh Kyzy: *See—*
Aliev, Vagab Safarovich; Kasimova, Adilya Khanum Panakh Kyzy; Muravchik, Mariam Efimovna; Ter-Sarkisov, Beniamin Georgievich; and Kyazimov, Shamil Kyazim Ogly, 3,867,471.

Kasuga, Kesaharu; Abe, Takeo; and Haga, Tsunehiro, to Paramount Glass Mfg. Co. Ltd. Apparatus for manufacturing glass fibers. 3,867,119, Cl. 65-12.000.

Katayama, Hajime: *See—*
Kitajima, Tadayuki; and Katayama, Hajime, 3,866,575.

Katayama, Nobuaki: *See—*
Nakata, Tadao; Mizutani, Hideaki; Ito, Shinichi; Okada, Mitsuhiko; and Katayama, Nobuaki, 3,866,488.

Katoh, Hiroshi, to Victor Company of Japan Ltd. Automatic tape loading type, recording and/or reproducing apparatus. 3,866,856, Cl. 242-188.000.

Katris, Thomas C. Rotisserie. 3,866,527, Cl. 99-421.00H.

Katz, Harry S.: *See—*
Orlando, Joseph M.; Katz, Harry S.; and Rainford, Jack W., 3,867,164.

Katz, Jerome, to Delaware Photographic Products, Inc. General purpose monobath. 3,867,151, Cl. 96-61.00M.

Katz, Otto, to A. W. Faber-Castell. Writing utensil. 3,866,992, Cl. 211-69.500.

Kaul, Dietmar, to Ernst Leitz GmbH. Photoelectric step marker. 3,867,035, Cl. 356-110.000.

Kawaguchi Seiko Kabushiki Kaisha: *See—*
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Kawamura, Shigeo: *See—*
Murakami, Masuo; Kawata, Ryuichi; Kawamura, Shigeo; Takamura, Shuichi; Hirano, Takayoshi; and Tomuro, Kouji, 3,867,414.

Kawamura, Takeji. Lock device of a shot gun. 3,866,344, Cl. 42-16.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
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Kawata, Ryuichi: *See—*
Murakami, Masuo; Kawata, Ryuichi; Kawamura, Shigeo; Takamura, Shuichi; Hirano, Takayoshi; and Tomuro, Kouji, 3,867,414.

Kawulka, Paul; Haffenden, Walter J.; and Mackiw, Vladimir N., to Gordon Sherritt Mines Limited. Recovery of zinc from zinc sulphides by direct pressure leaching. 3,867,268, Cl. 204-119.000.

Keahey, Joe H.: *See—*
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Kearney, Patricia A. Pear tree decoration. 3,867,237, Cl. 161-24.000.

Keating, Walter G.: *See—*
Torpie, John D.; Bell, Allan J.; Gorham, Michael L.; and Keating, Walter G., 3,867,702.

Kebba, John J. Method for forming special insert for advertising brochures, magazines and the like. 3,866,900, Cl. 270-5.000.

Keeler, Frederick D.; and Ellis, Carleton, Jr., to KLM Company, The. Container closure with liner and methods of making the same. 3,866,845, Cl. 215-341.000.

Keeney, Franklin N.; and Sommerfield, Edmund H., to Dow Chemical Company, The. Color inhibitors in glycol ethers. 3,867,462, Cl. 260-611.500.

Kellems, Kenneth K.: *See—*
Gewfrtz, Harry R.; and Kellems, Kenneth K., 3,867,621.

Keller, Howard F., Jr. Oil-water separation process. 3,867,285, Cl. 210-32.000.

Keller & Knappich Augsburg Zweigneiderlassung der Industrie-Werke Karlsruhe Augsburg Aktiengessellschaft: *See—*
Uhl, Siegfried; and Schiele, August, 3,866,514.

Kellner, Ferdinand. Diapositive copying apparatus for photographic cameras. 3,867,028, Cl. 355-18.000.

Kemner, Axel; and Conradt, Rudi, to WABCO Westinghouse GmbH. Manifold for selectively distributing a fluid pressure medium. 3,866,625, Cl. 137-269.000.

Kemp, James C. Symmetric birefringence modulator. 3,867,014, Cl. 350-149.000.

Ken-McGee Chemical Corporation: *See—*
Jenney, John William; Donaghu, Dennis Ambrose; Cartsunis, Louis Peter; and Batchelor, Donald Sylvester, 3,867,125.

Kennecott Copper Corporation: *See—*
Skarbo, Roald R.; Galin, Walter E.; and Natwig, David L., 3,867,506.

Kennedy, Harry R., to Richen Co., Inc., The. Yarn processing apparatus and process. 3,866,279, Cl. 28-62.000.

Kenny, John; and Wilds, Alan, to Devices Implants Limited. Pessary ring electrode system. 3,866,613, Cl. 128-408.000.

Kenward, Alan: *See—*
Gratton, Charles Peter; Hoper, Alan Thomas; and Kenward, Alan, 3,867,253.

Kerr, Raymond W. Readily re-closeable and re-usable container of the lid and openhead drum type. 3,866,794, Cl. 220-320.000.

Kersten, Gunter; Fricke, Hans-Jurgen; and Veil, Karl, to Robert Bosch G.m.b.H. Fluidic circuit for a hydrostatic transmission. 3,866,421, Cl. 60-456.000.

Kersten, Gunter, to Robert Bosch G.m.b.H. Hydraulic drive. 3,866,422, Cl. 60-456.000.

Kessler, Gerald. Siding with loose plastic film facing. 3,866,378, Cl. 52-519.000.

Ketley, Arthur D., to W. R. Grace & Co. Printing plate process and apparatus using a laser scanned silver negative. 3,867,150, Cl. 96-36.300.

Keuffel & Esses Company: *See—*
Lukeian, Joseph, 3,867,154.

Kewanee Machinery & Conveyor Co.: *See—*
Anderson, Charles W., 3,866,689.

Key, Grahame Russell, to Hoover Company, The. Pulley drive system. 3,866,487, Cl. 74-230.17E.

Keyzer, Carl A.: *See—*
Dobeus, William J.; Cheetham, James V.; Pacheco, Daniel; Keyzer, Carl A.; and Sandrock, Don G., 3,866,942.

Khasin, Kim Moiseevich: *See—*
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Kiefer, Hans; Mueller, Albrecht; Koenig, Karl-Heinz; Rohr, Wolfgang; and Adolphi, Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted carbamates. 3,867,428, Cl. 260-479.00C.

Kiener, Heinz: *See—*
Garrett, Roy Peter; Parkins, Derek Ray; and Kiener, Heinz, 3,866,732.

Kikuchi, Makoto, to Toyoda-Koki Kabushiki-Kaisha. Surface grinding apparatus. 3,866,359, Cl. 51-120.000.

Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 5-Amino-2,6-substituted-7h-pyrrolo(2,3-d)pyrimidines and related compounds. 3,867,386, Cl. 260-256.40F.

Kim, Heung T., to B. F. Goodrich Company, The. Apparatus for extruding polymeric material. 3,867,079, Cl. 425-208.000.

Kimmelaar, Rudolf Johan, to Cincinnati Milacron Inc. Dynamic balancing apparatus. 3,866,489, Cl. 74-573.000.

Kimura, Jin-Ichi: *See—*
Wakabayashi, Senzo; Kusaba, Akira; Koyano, Takayuki; Nakano, Sukenori; Kimura, Jin-Ichi; and Oyamada, Akira, 3,866,449.

King, Albert C., Jr.: *See—*
Van Horn, Russell F.; Bok, Lowell D.; King, Albert C., Jr.; Suerdieck, Ronald R.; and Thrower, Arthur J., 3,867,230.

King, Alfred Douglas, Jr.: *See—*
Jurd, Leonard; Stevens, Kenneth L.; and King, Alfred Douglas, Jr., 3,867,548.

King, James R. High energy wind dissipation adjacent buildings. 3,866,363, Cl. 52-29.000.

King, Paul B., to Cessna Aircraft Company, The. Instrumentation system containing a null shifting means. 3,867,680, Cl. 318-584.000.

King, Paul B., to Cessna Aircraft Company, The. Relative movement system having alarm means. 3,867,716, Cl. 340-27.00R.

King, Robert, III: *See—*
Peterson, Harry S., Jr.; Peterson, Charles M.; and King, Robert, III, 3,866,384.

King, Walter F.: *See—*
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Kipfmueller, Max H., to American Greetings Corporation. Decorative figurine and dispenser. 3,866,803, Cl. 222-179.500.

Kirichenko, Boris Mefodievich: *See—*
Krasik, Yakov Lvovich; Rappoport, Leonid Iosifovich; Gelbin, Anatoly Nikolaevvich; Marsjuk, Nikolai Andreevich; Gura, Anatoly Nikitovich; and Kirichenko, Boris Mefodievich, 3,867,669.

Kirillova, Olga Georgievna: *See—*
Gorkovenko, Boris Konstantinovich; Mikhailovsky, Alexandr Mikhailovich; Churilova, Valentina Dmitrievna; and Kirillova, Olga Georgievna, 3,867,098.

Kissell, Ronald E.: *See—*
Rood, Leonard D.; and Kissell, Ronald E., 3,867,494.

Kitajima, Tadayuki; and Katayama, Hajime, to Canon Kabushiki Kaisha. Magnet roll developing device. 3,866,575, Cl. 118-637.000.

Kitani, Koichi: *See—*
Mizu, Koichi; Kitani, Koichi; and Mori, Yubi, 3,866,641.

Kitz, Norbert; and Drage, James John, to Bell Punch Company Limited. Magnetic drive mechanisms for printing heads. 3,867,675, Cl. 318-119.000.

Kizler, Harald: *See—*
Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, 3,866,980.

Kjos, Magne J., to Burroughs Corporation. Mechanical drag brake assembly. 3,866,722, Cl. 188-75.000.

Klages, Robert; and Kleeschulte, Heinrich, to Hoesch Aktiengesellschaft. Method of casting quiet steel in molds. 3,866,662, Cl. 164-123.000.

Klapper, Franz, to Jenoptik Jena G.m.b.H. Method for producing super smooth photo plates. 3,867,227, Cl. 156-249.000.

Klatt, Alfred, to WABCO Westinghouse GmbH. Antiskid vehicle brake system for individual wheel control. 3,866,981, Cl. 303-21.00A.

Klatt, Alfred: *See—*
Geier, Georg; and Klatt, Alfred, 3,866,982.

Klaus, Kaspar. Multi-level parking apparatus. 3,866,766, Cl. 214-16.10E.

Kleeschulte, Heinrich: *See—*
Klages, Robert; and Kleeschulte, Heinrich, 3,866,662.

Kleimenov, Vasily Yakovlevich: *See—*
Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich, 3,867,208.

Klein, Imrich: *See—*
Tadmor, Zehev; and Klein, Imrich, 3,866,890.

Klemchuk, Peter, to Ciba-Geigy Corporation. Substituted hydroxylamine anti-oxidants. 3,867,445, Cl. 260-561.00A.

Klendauer, Wolfgang: *See—*
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Kletschka, Harold D. Cardiovascular clamps. 3,866,610, Cl. 128-322.000.

Kligman, Albert M., to Westwood Pharmaceuticals, Inc. Acne composition. 3,867,522, Cl. 424-153.000.

Klimek, Boleslaw, to Berg Manufacturing Companay, The. Tractor protection valve. 3,866,623, Cl. 137-102.000.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. Phenolic antioxidants. 3,867,467, Cl. 260-622.00R.

Kline, Roy E.: *See—*
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KLM Company, The: *See—*
Keeler, Frederick D.; and Ellis, Carleton, Jr., 3,866,845.

Klock, Elizabeth A. Shell game. 3,866,921, Cl. 273-138.00R.

Klose, Klaus, to Agfa-Gevaert Aktiengesellschaft. Duct for film-containing cassettes. 3,866,744, Cl. 198-278.000.

Kluge, Arthur F.; Untch, Karl G.; and Fried, John H., to Syntex, Inc. Method of making 13-cis prostaglandin derivatives. 3,867,377, Cl. 260-240.00R.

Kluge, Arthur F.: *See—*
Alvarez, Francisco S.; Kluge, Arthur F.; and Fried, John H., 3,867,375.

Knapp, Heinrich, to Robert Bosch G.m.b.H. Automotive fuel heating control system. 3,866,587, Cl. 123-122.00F.

Kneile, Karl, to Robert Krause KG Zweiniederlassung Weilheim/Teck. Collapsible fitting. 3,866,866, Cl. 248-16.000.

Knight, Lloyd F., to Textron Inc. Lens blocking device. 3,866,667, Cl. 164-334.000.

Knoll, William A., to Jo-Line Tools, Inc. Torque multiplier. 3,866,492, Cl. 81-52.40R.

Knopka, William N., to FMC Corporation. Blend of flame-retardant poly (ethylene-2,6-napthalene dicarboxylate) fibers and flame-retardant cellulosic fibers. 3,866,405, Cl. 57-140.0BY.

Knourek, Jaroslav: *See—*
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Knowles, William T., to Shell Oil Company. Vapor recovery system. 3,867,111, Cl. 55-21.000.

Knox, Howard T.: *See—*
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Ohwa, Toshio; Taketomi, Kosaku; Tanaka, Osamu; Sakai, Bunshiro; Taira, Tadaaki; and Hirabayashi, Kiyoteru, 3,867,608.

Koberstein, Edgar; Luessling, Theodor; Noll, Ewald; Schaefer, Hans; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Method for the oxidizing alpha, beta-unsaturated aldehydes to alpha, beta-unsaturated carboxylic acids. 3,867,345, Cl. 260-530.00N.

Kobetz, Paul; and Lindsay, Kenneth L., to Ethyl Corporation. Process for the preparation; of glycolic acid. 3,867,440, Cl. 260-535.00R.

Koch, Terry David, to Inno-Cept Corporation. Method of fending collisions. 3,866,773, Cl. 214-152.000.

Koch, Wolfgang: *See—*
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,867,441.

Kodama, Yutaka: *See—*
Ishimaru, Toshiyasu; and Kodama, Yutaka, 3,867,371.

Koehler, Herman J., III. Roll-boxing apparatus. 3,866,388, Cl. 53-59.00R.

Koehring Company: *See—*
Brown, Gaylord W.; and Pickard, George L., 3,867,088.
Hansen, Loren F., 3,866,688.

Koenig, Karl-Heinz: *See—*
Kiefer, Hans; Mueller, Albrecht; Koenig, Karl-Heinz; Rohr, Wolfgang; and Adolphi, Heinrich, 3,867,428.

Koenig, Nathan H.; and Friedman, Mendel, to United States of America, Agriculture. Shrinkproofing of wool with cyclic acid anhydrides and zinc acetate. 3,867,095, Cl. 8-128.00R.

Kohn, Gustave K., to Chevron Research Company. Insect control methods employing certain substituted benzoates. 3,867,543, Cl. 424-301.000.

Kohn, Gustave K.: *See—*
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Kojimoto, Susumu: *See—*
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Kokoszka, John G.: *See—*
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Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
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Kolarik, Stanislav: *See—*
Skrabak, Michal; Vavrik, Ernest; Jadubik, Juraj; and Kolarik, Stanislav, 3,867,252.

Komorowski, Roman J.; Vernerey, Jean-C.; and Tournier, Gilles F. A., to ITT Industries, Inc. Electrical connection device. 3,867,004, Cl. 339-95.00D.

Komp, Richard J.: *See—*
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Kondo, Shinichi: *See—*
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Kondo, Toshiyuki, to Aisin Seiki Kabushiki Kaisha. Anti-skid device for automotive vehicles. 3,866,983, Cl. 303-21.00F.

Konig, Klaus: *See—*
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Konishiroku Photo Industry Co., Ltd.: *See—*
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Kontani, Ryozo: *See—*
Seki, Kunio; and Kontani, Ryozo, 3,867,709.

Kopa, Richard D. High energy fuel atomization and a dual carburetion embodying same. 3,866,585, Cl. 123-119.00A.

Kopacz, Zeonon: *See—*
Marciniak, Zdzislaw; and Kopacz, Zeonon, 3,866,450.

Korelitz, Theodore H.; and Brodie, Alvin C., to Badger Company, Inc., The. Automated designing. 3,867,616, Cl. 235-151.100.

Korkut, Mehmet D. Apparatus for mounting stern rollers in anchor planting tenders. 3,866,555, Cl. 114-0.50R.

Korsell, Torsten; Larker, Hans; Lundblad, Erik; and Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Method of hydrostatically extruding compound material and compound billets. 3,866,306, Cl. 29-474.300.

Koski, Oscar H., to United States of America, Atomic Energy Commission. Electrodeless conductance measurement device. 3,867,688, Cl. 324-30.00A.

Kouril, Oldrich; and Knourek, Jaroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. D.c. exitation arrangement for a textile machine programmer. 3,866,442, Cl. 66-50.00R.

Koyanagi, Eiji: *See—*
Takechi, Taichi; Kumazawa, Ryozi; Umemoto, Kimikazu; Yamada, Toshimitsu; Kamiuchi, Junichi; and Koyanagi, Eiji, 3,866,316.

Koyano, Takayuki: *See—*
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Kozacka, Frederick J., to Chase-Shawmut Company, The. Method of manufacturing high-voltage fuse. 3,866,318, Cl. 29-623.000.

Koziol, Robert L. Brush eradicator. 3,866,397, Cl. 56-16.800.

Krasik, Yakov Lvovich; Rappoport, Leonid Iosifovich; Gelbin, Anatoly Nikolaevvich; Marsjuk, Nikolai Andreevich; Gura, Anatoly Nikitovich; and Kirichenko, Boris Mefodievich. Power source with a spark-proof output. 3,867,669, Cl. 317-16.000.

Kraus, Peter E.; and Newton, Kenneth C., to Mite Corporation. Self-tapping and self-retaining, screw thread insert. 3,866,509, Cl. 85-32.00R.

Krause Offset System KG: *See—*
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Krause, Willy, to Krause Offset System KG. Photosensitive materials for producing printing plates. 3,867,142, Cl. 96-35.100.

Krejci, Joseph C., to Phillips Petroleum Company. Method for producing carbon black. 3,867,513, Cl. 423-450.000.

Krekeler, Ulrich: *See—*
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Kremers-Urban Company: *See—*
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Kreutter, Erich; and Lindner, Hans, to ITT Industries, Inc. Printed circuit board connector and method and tool for removing contacts therefrom. 3,866,997, Cl. 339-217.00S.

Krickovich, Eli G. Snow remover with slurry disposal. 3,866,340, Cl. 37-12.000.

Kristiansen, Odd, to Ciba-Geigy Corporation. Trifluoromethyl-nitrophenyl-thio(dithio)phosphates. 3,867,483, Cl. 260-954.000.

Kronsecler, Herman: *See—*
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Krouse, Leroy M.: *See—*
Canova, Fred; Krouse, Leroy M.; and Hornschuch, Hanns, 3,867,066.

Krouskop, Ned C., to Pittsburgh Corning Corporation. Method for opening the cells of cellular clay blocks. 3,867,498, Cl. 264-88.000.

Krug, Lawrence M., to Jeffreys, George C. Auxiliary refrigeration power means. 3,866,433, Cl. 62-229.000.

Kruger, Horst: *See—*
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Kruger, Manfred: *See—*
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Krumm, Hagen; and Moeller, Friedrich-Wilhelm, to Metallgesellschaft Aktiengesellschaft. Process for producing methane-rich gases from hydrocarbons. 3,866,353, Cl. 48-214.000.

Kryah, John C.; and Barnett, Charles B., to Diebold, Incorporated. Pneumatic tube carrier detector assembly with cam operated microswitch and resilient finger heeler means. 3,867,593, Cl. 200-61.410.

Kuchar, Paul J.: *See—*
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Kummer, Frederick J., to Abcor, Inc. Cement restrictor for total hip operations. 3,866,248, Cl. 3-1.000.

Kunz, Horst. Coil winding machine. 3,866,852, Cl. 242-82.000.

Kunze, Bernhard, to Wilhelm Hengenscheidt GmbH. Surface smoothing arrangement. 3,866,281, Cl. 29-90.00R.

Kupelian, Robert Howard, to American Cyanamid Company. Cold and frost tolerance in living plants with 3,6-dioxo-4-pyridazine acetic acid derivatives. 3,867,126, Cl. 71-92.000.

Kupershmidt, Felix Borisovich: *See—*
Pavlov, Anatoly Petrovich; Bogomolov, Vladimir Matveevich; Kupershmidt, Felix Borisovich; Nechitailo, Igor Afanasievich; Nosilov, Nikolai Nikolaevich; and Levin-Kogan, Isaak Zalmanovich, 3,866,673.

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Kyker, Gary Stephen, to Firestone Tire & Rubber Company, The. Metal 8-hydroxyquinolate complexes as stabilizers for poly(phosphazenes) to inhibit thermal degration at elevated temperatures. 3,867,341, Cl. 260-45.75R.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
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La Cook, Hardy L.; and Conklin, John H., to Fabenco Incorporated. Safety gate. 3,866,356, Cl. 49-386.000.

Lacroix, Daniel. Ski binding. 3,866,929, Cl. 280-11.35T.

Laflin, Reginald E. Refining apparatus and processes. 3,867,563, Cl. 13-27.000.

Lagarde, Francois A., to Compagnie Francois de Raffinage. Combustion engine. 3,866,582, Cl. 123-53.00A.

Lagercrantz, Carl Bertil Bengt; and Finden, Carl Johan Staffan, to Virsbo Bruks AB. Process for the production of mild steel tubes. 3,867,210, Cl. 148-16.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
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Lakeside Equipment Corporation: *See—*
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Laky, Tibor, to Otis Engineering Corporation. Apparatus for inserting flexible pipe into wells. 3,866,679, Cl. 166-77.000.

Lambert, George M., to Reliance Electric Company. Vent plug for gear case. 3,866,789, Cl. 220-44.00R.

Lambertus, Friedrich, to Werner & Pfleiderer. A granulating device for granulating synthetic plastics material in a flowable stage. 3,867,082, Cl. 424-313.000.

Lambrechts, Jan Bernard: *See—*
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Landry, Robert G.; and Jenney, Sherman R. Truck air foils. 3,866,967, Cl. 296-1.00S.

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Larkin, Artemas M., to Lockheed Aircraft Corporation. Internal locking device. 3,866,650, Cl. 151-21.00C.

LaRocca, Martin, to Singer Company, The. Mount for air conditioner components. 3,866,867, Cl. 248-23.000.

Larralde, Edward; and Robinson, Glen, to Vetco Offshore Industries, Inc. Method and apparatus for the control of a weight suspended from a floating vessel. 3,866,696, Cl. 175-5.000.

Larsen, Carl Ib Peder, to Haldex Aktiebolog. Conversion unit for electrical signal sequences. 3,867,617, Cl. 235-151.320.

Larson, Roger L.: *See—*
Barrett, John C.; and Larson, Roger L., 3,867,073.

Lasater, Donald A., to Dover Corporation. Sealing arrangement for liquid dispensing nozzle having vapor recovery. 3,866,636, Cl. 141-59.000.

Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.

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Latto, Nedwyn M. Shoe attachment for golfers. 3,866,339, Cl. 36-7.600.

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Lawson, David F.; and Lohr, Delmar F., Jr., to Firestone Tire & Rubber Company, The. Flame-resistant polybutadiene resin. 3,867,327, Cl. 260-27.0BB.

Lawson, Virgil Willis: *See—*
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Lay, Lowell B., Jr.; and Sanders, Andrew A., to Avco Corporation. Recycling electrometer. 3,867,695, Cl. 324-123.00R.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique. Read-write magnetic transducer having a composite structure comprising a stack of thin films. 3,867,368, Cl. 360-126.000.

Lebedev, Vladimir Konstantinovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.
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Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Lecailtel, Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Devices for positioning movable members of numerically controlled machines. 3,867,053, Cl. 408-13.000.

Lechevin, Jean-Claude, to Lipha, Lyonnaise Industrielle Pharmaceutique. Novel rodenticides compositions. 3,867,546, Cl. 424-331.000.

Lechner, Walter L., to Engler Instrument Company. One-way rotation control for synchronous motor shafts. 3,866,486, Cl. 74-425.000.

Lee, Norman John, to Matburn (Holdings) Limited. Operation tables and chairs. 3,866,899, Cl. 269-322.000.

Lee Pharmaceutical Products Ltd.: *See—*
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Lee, Wendell Maurice, to RCA Corporation. Spectrally sensitized electrophotographic materials. 3,867,144, Cl. 96-1.700.

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Leidig, Raymond H. Roto sod seeder. 3,866,552, Cl. 111-85.000.

Leiser, Hermann, to Strausak AG. Apparatus for the single withdrawal of articles in sheet form from a stack. 3,866,764, Cl. 214-8.50D.

Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Flaps for tires. 3,866,653, Cl. 152-365.000.

Lekan, Henry N.: *See—*
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Lemin, Alan J.; Moon, Malcolm W.; and Steinhards, Arnolds, to Upjohn Company, The. Certain 3-amino-2-(aminomethyl) propiophenones as fungicides and bactericides. 3,867,545, Cl. 424-325.000.

Lemley, Luther H., to Willem Corporation. Locking handle cock. 3,866,446, Cl. 70-176.000.

Lenc, John F.: *See—*
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Leveskis, Newton G.; and Abma, Charles B., to Argus Chemical Corporation. Non-hazardous ketone peroxide compositions. 3,867,461, Cl. 260-610.00A.

Levin-Kogan, Isaak Zalmanovich: *See—*
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Levin, Nathan. Knitted openwork elastic mesh fabric. 3,866,444, Cl. 66-195.000.

Levy, Moshe: *See—*
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Lewis, Donald Joseph, to Allied Chemical Corporation. Differentially inflatable restraining band for vehicles. 3,866,940, Cl. 280-150.0AB.

Lewis, Geoffrey Arthur, to Lucas Aerospace Limited. Fuel control apparatus for gas turbine engine. 3,866,416, Cl. 60-243.000.

Lewis, Linford H. Receptacle device with advertising means. 3,866,824, Cl. 232-43.200.

Lewis, Paul E., to A. B. Chance Company. Midspan electrical conductor spacer. 3,867,566, Cl. 174-146.000.

Leybourne, Allen E., III; and Baker, Terry H., to Monsanto Company. Polymerizer reactor. 3,867,104, Cl. 23-285.000.

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Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
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Liebherr, Hans: *See—*
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Liebscher, Anton I., to Ro-Search, Incorporated. Method of manufacture of shoes. 3,866,256, Cl. 12-142.0RS.

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Lincke, Wolfgang; Zimdahl, Walter; Andreas, Peter; Schimkat, Harald; and Kuhlborn, Hans, to Volkswagenwerk Aktiengesellschaft. Vehicle steering arrangement. 3,866,706, Cl. 180-79.20R.

Linden-Alimak AB: *See—*
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Lindner, Hans: *See—*
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Ling, Chung-Mei, to Abbott Laboratories. Direct radioimmunoassay for antigens and their antibodies. 3,867,517, Cl. 424-1.000.

Linn, Donald F.; and Wishart, George L., to Lipe-Rollway Corporation. Self-adjusting release mechanism for friction clutches. 3,866,733, Cl. 192-111.00A.

Linzberger, Robert, to Gebrueder Buehler AG. Grinding mill. 3,866,842, Cl. 241-47.000.

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Lipschutz, Paul, to Societe d'Exploitation des Brevets Neiman; and Societe d'Exploitation des Brevets Neiman. Electric multipolar rotatable switch with helical rotor drive. 3,867,601, Cl. 200-158.000.

List, Herbert A., to List Industries, Incorporated. Recessed locking mechanism. 3,866,961, Cl. 292-336.300.

List Industries, Incorporated: *See—*
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Litke, E. David, to Dynamics Research Corporation. Linear motion encoder. 3,867,037, Cl. 356-169.000.

Litton Systems, Inc.: *See—*
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Lobbe, Armin, to Gewerkschaft Eisenhutte Westfalia; and Gewerkschaft Eisenhutte Westfalia. Tunnel driving apparatus. 3,866,426, Cl. 61-85.000.

Locher, Johannes: *See—*
Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, 3,866,980.

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Lodding Engineering Corporation: *See—*
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Loffler, Oskar; Schlosser, Rudolf; and Dornheim, Gunther. Method and apparatus for controlling the dyeing of textile materials. 3,867,040, Cl. 356-181.000.

Logemann, Johan D., to Stamicarbon N.V. Process for preparing urea. 3,867,442, Cl. 260-555.00A.

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Long, Olan L.; and Sayward, Richard W., to Westinghouse Electric Corporation. Integral corner fabrication. 3,867,107, Cl. 29-190.000.

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Lord Corporation: *See—*
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Lord, Richard S.: *See—*
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Loskutov, Pavel Petrovich: *See—*
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Lotus Games, Inc.: *See—*
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Lou, Nils, to Lotus Games, Inc. Dynamically interacting toy blocks. 3,866,338, Cl. 35-69.000.

Lovitt, Dennis Ronald; Grosheim, Gene Edward; and Jaisle, Richard Frederick, to Formica Corporation. Method of cleaning the surface of a decorative plastic laminate. 3,867,198, Cl. 134-29.000.

Lubbers, Le Roy: *See—*
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Lucas Aerospace Limited: *See—*
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Lucas, Charles M. Portable hoist. 3,866,759, Cl. 212-8.00R.

Lucas Electric Co., Ltd., The: *See—*
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Lukeian, Joseph, to Keuffel & Esses Company. Desalination of silver halide photographic emulsions utilizing sulfated polyvinyl alcohol. 3,867,154, Cl. 96-94.00R.

Lund, John R. Clothes dryer for bathrooms. 3,866,757, Cl. 211-105.100.

Lundberg, Robert D., to Exxon Research and Engineering Company. Process of making a foamed ionic polymer. 3,867,319, Cl. 260-2.50R.

Lundblad, Erik: *See—*
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Lundgren, Evert Gustav, to Sandvik Aktiebolag. Cutting insert. 3,866,282, Cl. 29-95.000.

Lunn, Edward O., to Nicholson Manufacturing Company. Overhung disk chipper. 3,866,843, Cl. 241-55.000.

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M. C. Guarino Associates, Inc.: *See—*
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Maas, Rudolf J.: *See—*
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Machytka, Herbert, to Hartmann & Braun Aktiengesellschaft. Paramagnetic gas analyzer. 3,866,461, Cl. 73-23.000.

MacKeand, James Crawford B.: *See—*
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Mackey, Charles A. Apparatus for chemical treatment of swimming pools. 3,867,290, Cl. 210-138.000.

Mackiw, Vladimir N.: *See—*
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Miyao, Takayuki; Maeda, Hiroaki; Sato, Masanori; and Motoyama, Hiroshi, 3,866,518.

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Maekawa, Hiroshi; and Yamauchi, Choji, to Giichi Okuno. Baths for activating the surface of plastics to be chemically metal-plated. 3,867,174, Cl. 117-47.00A.

Maekawa, Kouji; and Tamura, Yutaka, to Pioneer Electronic Corporation. Loudspeaker with flat frequency characteristics. 3,867,586, Cl. 179-115.50H.

Maekawa, Takehiko: *See—*
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Maender, Otto W.: *See—*
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Maggs, Charles; and Weick, Walter Werner, to Bell Telephone Laboratories, Incorporated. Methods for making electronic circuits. 3,867,217, Cl. 156-3.000.

Magner, Edward J. Torch head construction. 3,866,839, Cl. 239-416.500.

Magovern, George J.: *See—*
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Magro, Alfred E.: *See—*
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Maimstrom, Sven-Erik; and Sporre, Sten, to Forsheda Ideutveckling AB. Device for increasing the elastic force of and reinforcing objects manufactured from an elastic material. 3,866,925, Cl. 277-164.000.

Maki, Kiyoshi: *See—*
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Malamoud, Jean Gaston. Lighters. 3,867,091, Cl. 431-350.000.

Malatesta, Alberto; and Baldwin, Francis P., to Esso Research and Engineering Company. UV curing of conjugated diene-containing butyl rubber. 3,867,270, Cl. 204-159.180.

Malavazos, Arthur J., to AJM Research Corporation. Device for binding sheets. 3,866,274, Cl. 24-153.000.

Malec, Robert E., to Ethyl Corporation. Lubricant. 3,867,298, Cl. 252-49.800.

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Mallory, Merrit L.: *See—*
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Malo, Lowell L., to ACF Industries Incorporated. Box car end structure. 3,866,546, Cl. 105-410.000.

Maloof, Samuel, to United States of America, Navy. Film viewer display encoder. 3,867,612, Cl. 235-61.70R.

Malootian, Markay H.: *See—*
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Maly, George P.; and Fischer, Paul W., to Union Oil Company of California. Method for placing cement in a well. 3,866,683, Cl. 166-292.000.

Malz, Russell E., Jr.; and Greenfield, Harold, to Uniroyal, Inc. Nuclear hydrogenation of n-aryl polyamides. 3,867,443, Cl. 260-561.00R.

Mancini, Lawrence R.: *See—*
Zepp, Philip H.; and Mancini, Lawrence R., 3,866,459.

Mandon, Jean-Pierre: *See—*
Hennart, Claude; Mandon, Jean-Pierre; Martin, Georges; and Rabussier, Bernard, 3,867,526.

Mann, Henry: *See—*
Colton, John Robert; and Mann, Henry, 3,867,579.

Mannesmann Leichtbau Gesellschaft mit beschrankter Haftung: *See—*
Hiergeist, Richard, 3,866,718.

Manning, Robert A., Jr. Means for carrying and displaying articles. 3,866,748, Cl. 206-111.000.

Manning, Roger L.: *See—*
Powers, James W.; and Manning, Roger L., 3,867,501.

Marchard, Gustav, to Gebr. Bohler & Co. AG. Stamping knife. 3,866,491, Cl. 76-101.00R.

Marchevka, Franz, to Hartmann & Braun-Mess-und Regeltechnik Aktiengesellschaft. Dc-to-ac-to-dc-inverter. 3,867,683, Cl. 321-2.000.

Marci, Vincent C.; Osborn, James E.; and Watkins, David F. Golf putter with imbedded alignment indicator. 3,866,922, Cl. 273-164.000.

Marciniak, Zdzislaw; and Kopacz, Zeonon, to Polichtechnika Warszawska. Method of making internal shapes in metal objects having smooth or toothed rotational outer surfaces. 3,866,450, Cl. 72-76.000.

Marin, Glenn R., to Carborundum Company, The. Process for reinforced carbon bodies. 3,867,491, Cl. 264-29.000.

Marion, Charles P.; Schlinger, Warren G.; Brent, Albert; and Muenger, James R., to Texaco Inc. Gas turbine process utilizing purified fuel and recirculated flue gases. 3,866,411, Cl. 60-39.020.

Marion, Thomas E.; and Collins, Richard D., to Maryland Cup Corporation. Conical container with dome-shape lid. 3,866,790, Cl. 220-24.00R.

Marjuschenko, Vilen Fedorovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Marker, Hannes. Pair of ski poles. 3,866,931, Cl. 280-11.37B.

Marplex Products Co., Inc.: *See—*
Sweet, Harold J.; and Grimm, John G., Jr., 3,866,640.

Marra, Theodore, to Goodyear Tire & Rubber Company, The. Tire building drum. 3,867,229, Cl. 156-417.000.

Marsh, Barry T., to Dresser Industries, Inc. Leak detection apparatus. 3,866,798, Cl. 222-52.000.

Marshall, Richard P.; Rice, James E.; and Stokes, James D., to Goodyear Tire & Rubber Company, The. Tire force variation machine. 3,866,465, Cl. 73-146.000.

Marsjuk, Nikolai Andreevich: *See—*
Krasik, Yakov Lvovich; Rappoport, Leonid Iosifovich; Gelbin, Anatoly Nikolaevvich; Marsjuk, Nikolai Andreevich; Gura, Anatoly Nikitovich; and Kirichenko, Boris Mefodievich, 3,867,669.

Martin Concrete Engineering Company: *See—*
Elliston, Thomas L., 3,866,480.

Martin, Georges: *See—*
Hennart, Claude; Mandon, Jean-Pierre; Martin, Georges; and Rabussier, Bernard, 3,867,526.

Maruyama, Isamu: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Mori, Kazuo; Kume, Yoshiharu; and Izumi, Takahiro, 3,867,372.

Maryland Cup Corporation: *See—*
Marion, Thomas E.; and Collins, Richard D., 3,866,790.

Masai, Toshio. High speed packaging device. 3,866,394, Cl. 53-183.000.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See—*
Straube, Elmar, 3,867,194.

Massachusetts Institute of Technology: *See—*
Baker, Richard H.; and Bannister, Lawrence H., 3,867,643.

Massey, Robert M.: *See—*
Webb, Albert A.; and Tullis, James Paul, 3,866,630.

Mastriani, Elvin A.; and Pozar, Frank A., to Arrow Converting Equipment, Inc. Rewind arm assembly. 3,866,853, Cl. 242-65.000.

Matarelli, Frank W. Whip finishing tool. 3,866,959, Cl. 289-17.000.

Matburn (Holdings) Limited: *See—*
Lee, Norman John, 3,866,899.

Mathias Bauerle GmbH, Firma: *See—*
Schinke, Heinz Joachim; and Uhing, Hans-Dieter, 3,866,534.

Mathis, Harold J. Prefabricated animal house. 3,866,577, Cl. 119-19.000.

Matolcsy, Gyorgy; and Bordas, Barna, to Eszakmagyarorszagi Vegyimuvek. Process for the preparation of substituted chloroacetanilides. 3,867,446, Cl. 260-562.00B.

Matson, Carl G. Rotary roller lubricant accumulator. 3,866,716, Cl. 184-14.000.

Matsumoto, Hirofumi: *See—*
Nakada, Masahiko; Maekawa, Takehiko; and Matsumoto, Hirofumi, 3,866,588.

Matsumoto, Hiromitsu, to Yamaha Hatsudaki Kabushiki Kaisha; and Yamaha Hatsudoki Kabushiki Kaisha. Carburetor for internal combustion engines. 3,867,487, Cl. 261-41.00D.

Matsumoto, Hisao: *See—*
Suzuki, Toshio; Terada, Takami; Fukumoto, Ryoichi; and Matsumoto, Hisao, 3,866,270.

Matsumoto, Kiyoshi: *See—*
Horiuchi, Takefumi; Monju, Yoshiyiki; Tatara, Isamu; Nagai, Nobuyuki; Hisata, Manabu; and Matsumoto, Kiyoshi, 3,867,209.

Matsushita Electric Industrial Co., Ltd.: *See—*
Mizu, Koichi; Kitani, Koichi; and Mori, Yubi, 3,866,641.

Matsushita, Sachio: *See—*
Iwano, Haruhiko; and Matsushita, Sachio, 3,867,419.

Matthews, Charles W.: *See—*
Schora, Frank C.; and Matthews, Charles W., 3,867,110.

Matthews, Russell E.: *See—*
Ott, Jack J.; Matthews, Russell E.; and Lawrence, Garth D., 3,867,177.

Mauck, Harold R., to Standard Abrasives Incorporated. Replaceable pad assembly. 3,866,361, Cl. 51-358.000.

Maudsley, Russell J., to Newton Chambers & Company Limited. Preparation of ninhydrin. 3,867,457, Cl. 260-590.000.

Maurischat, Guenther: *See—*
Szostak, Roland; Maurischat, Guenther; and Krekeler, Ulrich, 3,866,573.

Maxey, Frank S., to Goodyear Tire & Rubber Company, The. Antihardeners for polymers. 3,867,334, Cl. 260-42.320.

Maxon, Glenway W., III, to Stowell Industries Inc. Mobile conveyor system. 3,866,889, Cl. 259-161.000.

May, Donald L., to J. E. Love Company. Feeder panel for a harvesting machine. 3,866,400, Cl. 56-158.000.

Mayer, Peter; and Sutor, Anton Heinz, to Hellma GmbH & Co. Cuvette construction. 3,867,042, Cl. 356-246.000.

Maynard, Harry; and Boot, Roy Desmond, to Hawker Siddeley Aviation Limited. Rotary couplings. 3,866,955, Cl. 285-136.000.

Mayo, Alfred M.: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,866,826.

McCabe, Francis J. Folding blade fire damper. 3,866,656, Cl. 160-84.000.

McCabe, Francis J. Fire damper. 3,866,657, Cl. 160-181.000.

McCaughey, William Stephen, to Bunker Ramo Corporation. Insertion tool for insulation piercing contact. 3,866,294, Cl. 29-203.00H.

McCord Corporation: *See—*
Traum, Robert J., 3,866,926.
Weller, Peter A., 3,866,963.

McCoy, Michael R., to Electronic Arrays, Inc. MOSFET circuitry for integrated chips interfacing with higher voltage devices. 3,867,646, Cl. 307-251.000.

McCulloch Corporation: *See—*
Smith, Stephen Hagar, 3,867,679.

McDonald, Alexander D.: *See—*
Rich, Frank D., Jr.; and McDonald, Alexander D., 3,866,672.

McDonnell Douglas Corporation: *See—*
Downing, James W., 3,867,044.

McGraw-Edison Company: *See—*
Jawelak, Melbourne G.; and Boni, Richard R., 3,867,597.
Jawelak, Melbourne G., 3,867,602.

McIntosh, Duane E., to General Motors Corporation. Three phase jump encoder and decoder. 3,867,574, Cl. 178-67.000.

McKeen, Leighton R. Reciprocating motion control device. 3,866,478, Cl. 74-40.000.

McLeod, Gerald L.: *See—*
French, Hollis E.; Herbine, Stanley C.; and McLeod, Gerald L., 3,867,235.

McMillen, Kenneth R.: *See—*
Fell, Ferol S.; Long, William D.; and McMillen, Kenneth R., 3,866,399.

McNeil, Gary, to Prince Corporation. Bone holding mechanism. 3,866,271, Cl. 17-1.00G.

McNeil Laboratories, Incorporated: *See—*
Reynolds, Brian E.; and Carson, John R., 3,867,374.

McRae, William P. Storage and dispensing cabinet. 3,866,990, Cl. 312-15.000.

Medlock, Dan. Floor model space heater. 3,866,593, Cl. 126-91.00A.

Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.

Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Medvedenko, Nikolai Fedorovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Meijer, Geertruida M.; Ritter, Fridolin J.; Minks, Albert K.; Voerman, Simon; and Persoons, Cornelis J., to Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer. Trap containing pheromone. 3,866,349, Cl. 43-114.000.

Melvin, Darrell: *See—*
Cornell, James H., 3,867,292.

Mende, William Carl: *See—*
Costello, Christopher H.; and Mende, William Carl, 3,867,549.

Menzi, Robert; and Zeller, Hartmut, to Vivil A. Muller & Co. Gelled protein process for the production of a gelled protein foodstuff. 3,867,560, Cl. 426-350.000.

Merck & Co., Inc.: *See—*
Pines, Seemon H., 3,867,378.
Shen, Tshung-Ying; and Jones, Howard, 3,867,433.

Merrell, Richard G.: *See—*
Ciciora, Walter S.; and Merrell, Richard G., 3,867,575.

Merriweather, Kenneth A., to Warwick Electronics Inc. Control circuit for an afc system. 3,867,568, Cl. 178-5.8AF.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Bahr, Alfred, 3,866,414.

Messner, Jakob. Apparatus to make pile fabrics in which pile threads are bonded to a base layer. 3,866,499, Cl. 83-278.000.

Mesta Machine Company: *See—*
Petros, Andrew J., 3,866,455.

Metallgesellschaft Aktiengesellschaft: *See—*
Krumm, Hagen; and Moeller, Friedrich-Wilhelm, 3,866,353.

Metallurgie Hoboken-Overpelt: *See—*
Ronneau, Gerard S.; Debacker, Pierre D.; and Carpentier, Hugo L., 3,867,129.

Meyer, Dorman A. Removal of marine growths from lakes, waterways, and other bodies of water. 3,866,396, Cl. 56-9.000.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt. 2-Amino-1,4-dihydropyridine derivatives. 3,867,393, Cl. 260-294.900.

Meyer, Willy: *See—*
Bohner, Beat; Dawes, Dag; and Meyer, Willy, 3,867,397.
Bohner, Beat; Dawes, Dag; and Meyer, Willy, 3,867,398.

Meyers, Karel G. L.: *See—*
Gerstel, Arnold W.; and Meyers, Karel G. L., 3,866,885.

Michaels, Alan S., to Alza Corporation. Bioerodible drug delivery device. 3,867,519, Cl. 424-19.000.

Michalak, Bogumil M.; and Bertellotti, Ansano, to GTE Automatic Electric Laboratories Incorporated. Latching spring clip device for securing electrical cable connectors to printed wiring cards. 3,867,000, Cl. 339-17.00L.

Mickus, Robert Z.: *See—*
Joella, Thomas; and Mickus, Robert Z., 3,867,624.

Microma Incorporated: *See—*
Yih, James, 3,866,313.

Microseal Corporation: *See—*
Anderson, Thomas P., 3,866,648.

Midland-Ross Corporation: *See—*
Schultz, Forrest O. E., 3,866,895.

Midwest Housing Research Corporation: *See—*
Falconer, John Paul Rutherford, 3,866,371.

Mifsud, Joseph F., to Exxon Production Research Company. Vibratory seismic energy generator. 3,866,709, Cl. 181-114.000.

Migneault, Maurice. Lightweight, small, combined gas and steam motor. 3,866,412, Cl. 60-39.190.

Mikhailovsky, Alexandr Mikhailovich: *See—*
Gorkovenko, Boris Konstantinovich; Mikhailovsky, Alexandr Mikhailovich; Churilova, Valentina Dmitrievna; and Kirillova, Olga Georgievna, 3,867,098.

Mikofalvy, Bela K.; and Doyle, Thomas J., to B. F. Goodrich Company, The. Process for making emulsion polymerized prepasticized vinyl resins. 3,867,331, Cl. 260-31.80R.

Miles, George N. Icing gun system for decorating confectionary articles. 3,866,838, Cl. 239-372.000.

Milicevic, Josip. Sled. 3,866,932, Cl. 280-12.00R.

Militana, Salvatore G.: *See—*
DeSantis, Nino M., 3,866,909.

Miller, Bernard J. Self-contained float device. 3,866,470, Cl. 73-313.000.

Miller, Frederick O., to Miller Mold Company. Adjustable mold. 3,867,084, Cl. 425-383.000.

Miller, James G.: *See—*
Tramuta, Salvatore S.; Miller, James G.; Adriance, Howard M.; and Barta, Robert W., 3,866,674.

Miller, Joseph P., to Emhart Corporation. Shut off system for glassware forming machine. 3,867,122, Cl. 65-159.000.

Miller Mold Company: *See—*
Miller, Frederick O., 3,867,084.

Miller, Ralph A.: *See—*
Elkins, Paul A.; Miller, Ralph A.; and Scheer, Lawrence E., 3,866,734.

Roper, William H.; Roper, Robert E.; and Roper, Charles R., 3,866,791.

Miller, Richard Guy; Brudi, Ronald Adair; and Brainard, Kenneth Lynley, to Weyerhaeuser Company. Material handling attachment for a forklift truck. 3,866,780, Cl. 214-655.000.

Miller, Samuel E., to Quick Service Textiles, Inc. Simulated woven fabrics. 3,867,242, Cl. 161-57.000.

Miller Steel & Supply Company, Incorporated: *See—*
Heil, Roland Lee; and Mroczkiewicz, Albert John, 3,866,884.

Miller, Thomas P.: *See—*
Pickens, Herman Leon; and Miller, Thomas P., 3,867,588.

Miller, William E.; Lenc, John F.; and Winsch, Irvin O., to United States of America, Atomic Energy Commission. Process for recovering uranium and plutonium from irradiated nuclear fuel oxides. 3,867,510, Cl. 423-251.000.

Millward, John David: *See—*
Blaxtan, Peter William; Millward, John David; and Such, Richard Thomas, 3,867,570.

Milton, Colin. Bottle height inspection apparatus. 3,866,753, Cl. 209-73.000.

Minagawa, Nobuhiko: *See—*
Tatsuta, Sumitaka; Ueno, Wataru; and Minagawa, Nobuhiko, 3,867,167.

Minami, Hideo, to Taiyo Seiki Co., Ltd. Bookbinding Machine. 3,866,568, Cl. 118-238.000.

Mindick, Morris; and Reven, Lewis E., to Nalco Chemical Company. Acidic stable salt-free silica sols. 3,867,304, Cl. 252-313.00S.

Miner, Carroll R., to General Instrument Corporation. Tuner drive assembly for selecting a limited number of channels in the UHF band. 3,866,479, Cl. 74-10.850.

Mingus, Ray E.; and Stuart, Ross M., to Kaiser Aerospace and Electronics Corporation. Non-latching, dry-break fluid coupling. 3,866,638, Cl. 141-352.000.

Minke, Charles M., to Hercules Incorporated. Integral filament reinforced composite-rocket chamber/adapter. 3,866,792, Cl. 220-72.000.

Minks, Albert K.: *See—*
Meijer, Geertruida M.; Ritter, Fridolin J.; Minks, Albert K.; Voerman, Simon; and Persoons, Cornelis J., 3,866,349.

Minkwitz, Joachim P. C., to Rockford Automation, Inc. Transfer mechanism. 3,866,537, Cl. 104-99.000.

Minnesota Mining and Manufacturing Company: *See—*
Collins, John E., 3,867,641.
Schoon, David J., 3,867,613.

Mino, Iwao: *See—*
Torii, Okihiko; Mizunuma, Tsutomu; Mino, Iwao; and Ando, Tetsuya, 3,867,161.

Minolta Camera Kabushiki Kaisha: *See—*
Ogawa, Masaya, 3,867,026.

Mirmelshtein, Valdislav Alexandrovich: *See—*
Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich, 3,867,208.

Misch, Wolfgang: *See—*
Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, 3,866,980.

Miskel, John J.; and Hom, Foo Song, to R. P. Scherer Corp. Method for absorption of drugs. 3,867,521, Cl. 424-37.000.

Missouri-Kansas-Texas Railroad Company: *See—*
Richard, James W., 3,866,543.

Mite Corporation: *See—*
Kraus, Peter E.; and Newton, Kenneth C., 3,866,509.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Takahashi, Kuniyuki, 3,866,944.

Mitsubishi Paper Mills, Ltd.: *See—*
Shimizu, Hideo, 3,867,169.

Mitsubishi Petrochemimcal Co., Ltd.: *See—*
Kanetka, Junichi; and Shimodaira, Takashi, 3,867,405.

Mitsubishi Rayon Company Limited: *See—*
Chimura, Kazuya; Ito, Kazuo; Nakamura, Yasuo; and Miyata, Seiji, 3,867,332.
Chimura, Kazuya; Iwata, Hiroshi; Nakamura, Yasuo; and Shiotsuki, Mitsuaki, 3,867,478.

Mitsui, Yoshihiro; and Kamakura, Hiroshi, to Kabushiki Kaisha Siwa Seikosha; and Kabushiki Kaisha Siwa Seikosha. Brushless direct current motor. 3,867,656, Cl. 310-68.000.

Miyahara, Masato, to Kabushiki Kaisha Morita Seisakusho. Apparatus for taking a continuous x-ray picture of the dental arch. 3,867,636, Cl. 250-445.000.

Miyahara, Sadayasu: *See—*
Takano, Ryoshiro; and Miyahara, Sadayasu, 3,867,302.

Miyao, Takayaki; Maeda, Hiroaki; and Sato, Masanori, to Aisin Seiki Co., Ltd. Piston of piston type fluid pump motor. 3,866,519, Cl. 91-488.000.

Miyao, Takayuki; Maeda, Hiroaki; Sato, Masanori; and Motoyama, Hiroshi, to Aisin Seiki Kabushiki Kaisha. Fluid pressure device of the axial plunger type. 3,866,518, Cl. 91-488.000.

Miyata, Akira; Okubo, Hideyo; Tomita, Chikayoshi; Suzuki, Akio; and Ito, Hidenobu, to Nippon Kokan Kabushiki Kaisha. Method of plating aluminum-chromium alloys. 3,867,266, Cl. 204-39.000.

Miyata, Seiji: *See—*
Chimura, Kazuya; Ito, Kazuo; Nakamura, Yasuo; and Miyata, Seiji, 3,867,332.

Miyazuka, Hajime: *See—*
Honjo, Satoru; and Miyazuka, Hajime, 3,867,145.

Mizu, Koichi; Kitani, Koichi; and Mori, Yubi, to Matsushita Electric Industrial Co., Ltd. Fluid-operated fastener feeding apparatus. 3,866,641, Cl. 144-32.000.

Mizumura, Yutaka: *See—*
Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, 3,867,480.

Mizunuma, Tsutomu: *See—*
Torii, Okihiko; Mizunuma, Tsutomu; Mino, Iwao; and Ando, Tetsuya, 3,867,161.

Mizutani, Hideaki: *See—*
Nakata, Tadao; Mizutani, Hideaki; Ito, Shinichi; Okada, Mitsuhiko; and Katayama, Nobuaki, 3,866,488.

Mizutani, Toshio: *See—*
Ueda, Kenzo; Mizutani, Toshio; Itaya, Nobushige; and Okuno, Yositosi, 3,867,542.

Mlavsky, Abraham I.; Bates, Herbert E.; and Siegel, Bernard, to Tyco Laboratories, Inc. Method and apparatus for producing fine-grated polycrystalline bodies. 3,867,496, Cl. 264-71.000.

Mobil Oil Corporation: *See—*
Fischer, Ronald H.; Ciric, Julius; and Whyte, Thaddeus E., Jr., 3,867,282.
Florian, John, 3,866,810.
Herrington, F. John, 3,867,083.
Holden, Morell J., Jr., 3,866,817.
Jones, Lloyd G.; and Stein, Nathan, 3,866,682.
Oleck, Stephen M.; and Stover, William A., 3,867,309.
Patton, Bobbie Joe, 3,867,714.
Schwab, Frederick C.; and Heilweil, Israel J., 3,867,295.

Model, Ernst: *See—*
von der Crone, Jost; Model, Ernst; and Pugin, Andre, 3,867,404.

Modine Manufacturing Company: *See—*
Bardon, Melvin C.; and Bauernfeind, Norman G., 3,866,675.

Moe, Stephen S. Portable traffic control system. 3,867,718, Cl. 340-31.00R.

Moehlenpah, Walter G. Apparatus for fabricating wood structures. 3,866,530, Cl. 100-53.000.

Moehring, John Theodore; and Lawson, Virgil Willis, to General Electric Company. Stall warning system for a gas turbine engine. 3,867,717, Cl. 340-27.0SS.

Moeller, Friedrich-Wilhelm: *See—*
Krumm, Hagen; and Moeller, Friedrich-Wilhelm, 3,866,353.

Moen, George A. Double acting slide switch assembly with telescopically arranged housings and normally centered movable contact. 3,867,599, Cl. 200-153.00K.

Mogilevsky, Alexandr Moiseevich: *See—*
Afanasiev, Alexandr Dmitrievich; and Mogilevsky, Alexandr Moiseevich, 3,866,453.

Moleculon Research Corporation: *See—*
Hook, Edwin O.; Berbeco, George R.; and Obermayer, Arthur S., 3,867,186.

Mollring, Frederick Jay, to Mollring Snoglide, Inc. Snowmobile ski guide. 3,866,933, Cl. 280-28.000.

Mollring Snoglide, Inc.: *See—*
Mollring, Frederick Jay, 3,866,933.

Monajjem, Freydoun, to General Tire & Rubber Company, The. Method for balance correcting pneumatic tires. 3,866,360, Cl. 51-281.00R.

Monju, Yoshiyiki: *See—*
Horiuchi, Takefumi; Monju, Yoshiyiki; Tatara, Isamu; Nagai, Nobuyuki; Hisata, Manabu; and Matsumoto, Kiyoshi, 3,867,209.

Monsanto Company: *See—*
Doleman, Jack; and Hills, William H., 3,866,404.
Leybourne, Allen E., III; and Baker, Terry H., 3,867,104.
Morgan, Herbert S., 3,867,499.
Olin, John F.; and Hamm, Philip C., 3,867,426.
Raffelson, Harold; and Suda, Michael, 3,867,411.
Trivette, Chester D., Jr.; and Maender, Otto W., 3,867,358.

Montagroni, Nevio. Apparatus for extracting juice from citrus fruit. 3,866,528, Cl. 99-495.000.

Montgomery Industries International Inc.: *See—*
Montgomery, W. T. S., 3,866,844.

Montgomery, W. T. S., to Montgomery Industries International Inc. Shavings making machine. 3,866,844, Cl. 241-282.200.

Moody, Carl A. Making and employing hair teasing combs. 3,867,502, Cl. 264-263.000.

Moon, Malcolm W.: *See—*
Lemin, Alan J.; Moon, Malcolm W.; and Steinhards, Arnolds, 3,867,545.

Moore, James G.; and Oltman, Fay W., to Souvenir/Inc. Pen stand. 3,866,756, Cl. 211-69.500.

Moore, Joseph E., to Chevron Research Company. Insecticidal phenylhydrazone sulfides. 3,867,449, Cl. 260-566.00B.

Moore, Joseph E., to Chevron Research Company. Insecticidal bisphenylhydrazone sulfides. 3,867,450, Cl. 260-566.00B.

Moore, Joseph E.; and Kohn, Gustave K., to Chevron Research Company. Insecticidal phenols. 3,867,547, Cl. 424-337.000.

Moore, Keith A., to Rockwell International Corporation. Recovery of sulfur values form molten salt. 3,867,514, Cl. 423-563.000.

Moorhead, John P.: *See—*
Nichols, Elton F.; Moorhead, John P.; and Wubbe, Leo J., 3,866,259.

Morbark Industries, Inc.: *See—*
Morey, Norval K.; and Smith, Leward N., 3,866,769.

More, George H., to Bausch & Lomb Incorporated. Strip chart holding device. 3,866,850, Cl. 242-68.400.

Morehouse, Edward L.; and Prokai, Bela, to Union Carbide Corporation. Partially crosslinked siloxane-polyoxyalkylene (sioc) block copolymer compositions and use thereof as surfactants in the production of polyurethane foams. 3,867,420, Cl. 260-448.80R.

Moreland, William C., II; and Van Dyck, Arie, to Westinghouse Electric Corporation. Apparatus for evacuating and sealing thermoplastic bags. 3,866,390, Cl. 53-79.000.

Morey, Inc.: *See—*
Morrill, Vaughan, Jr., 3,866,317.

Morey, Norval K.; and Smith, Leward N., to Morbark Industries, Inc. Wood chip handling system. 3,866,769, Cl. 214-44.00A.

Morgan, Barry S.; and Jaffe, Joseph, to Chevron Research Company. Hydroconversion process. 3,867,281, Cl. 208-213.000.

Morgan Construction Company: *See—*
Gould, David E., 3,866,283.

Morgan, Gerard E., to Riddell Inc. Headgear with automatic sizing means. 3,866,243, Cl. 2-3.00R.

Morgan, Herbert S., to Monsanto Company. Process for wet-spinning fibers derived from acrylic polymers. 3,867,499, Cl. 264-182.000.

Mori, Kazuo: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Mori, Kazuo; Kume, Yoshiharu; and Izumi, Takahiro, 3,867,372.

Mori, Shigeo; Akamatsu, Akira; and Togo, Kazushi, to Ajinomoto Co., Inc. Medicated polyamino acid film for occlusive dressing therapy. 3,867,520, Cl. 424-36.000.

Mori, Shigeo: *See—*
Akamatsu, Akira; Okuaki, Akira; and Mori, Shigeo, 3,867,352.

Mori, Toshihiro; and Ando, Seigo, to Nippon Kokan Kabushiki Kaisha. Measuring apparatus utilizing variable impedance elements. 3,867,689, Cl. 324-40.000.

Mori, Yubi: *See—*
Mizu, Koichi; Kitani, Koichi; and Mori, Yubi, 3,866,641.

Moriuchi, Shigenori: *See—*
Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; Moriuchi, Shigenori; Sato, Akira; and Ikeda, Tadashi, 3,867,146.

Morlock, Gerhard: *See—*
Felber, Wilfried; and Morlock, Gerhard, 3,867,347.

Morrice, Anthony Ronald Seaton, to Hudswell Morrice Ltd. Method of and apparatus for the driving and extractor of sheet piles. 3,866,425, Cl. 61-53.500.

Morrill, Vaughan, Jr., to Morey, Inc. Reed switches and process for making them. 3,866,317, Cl. 29-622.000.

Morstadt, Richard A., to GTE Automatic Electric Laboratories Incorporated. Electronic tone ringer. 3,867,585, Cl. 179-84.00T.

Morton, John; Stevens, Keith Drummond; and Thexton, Graham Spencer, to Cableform Limited. Semi-conductor clamping means. 3,867,003, Cl. 339-92.00R.

Morton, Robert O., to Bertea Corporation. Fluid control valve. 3,866,620, Cl. 137-83.000.

Moser, Paul: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 3,867,340.

Moskowitz, Seymour, to Curtiss-Wright Corporation. Shroud structure for turbine rotor blades and the like. 3,867,061, Cl. 415-174.000.

Motokura, Michio, to Kabushiki Kaisha Komatsu Seisakusho. Rock drill. 3,866,694, Cl. 173-75.000.

Motorola, Inc.: *See—*
Rutledge, James L., 3,867,204.
Rzeszewski, Theodore S., 3,867,010.

Motoyama, Hiroshi: *See—*
Miyao, Takayuki; Maeda, Hiroaki; Sato, Masanori; and Motoyama, Hiroshi, 3,866,518.

Mroczek, Werner; and Scherber, Werner, to Licentia Patent-Verwaltungs-GmbH. Method of contacting semiconductor regions in a semiconductor body. 3,866,312, Cl. 29-578.000.

Mroczkiewicz, Albert John: *See—*
Heil, Roland Lee; and Mroczkiewicz, Albert John, 3,866,884.

Mueller, Albrecht: *See—*
Kiefer, Hans; Mueller, Albrecht; Koenig, Karl-Heinz; Rohr, Wolfgang; and Adolphi, Heinrich, 3,867,428.

Mueller, Arthur C.; and Hapke, Kenyon A., to Bell & Howell Company. Motion picture camera system. 3,867,021, Cl. 352-72.000.

Muenger, James R.: *See—*
Marion, Charles P.; Schlinger, Warren G.; Brent, Albert; and Muenger, James R., 3,866,411.

Mukaiyama, Teruaki; Araki, Masashi; and Takei, Hisashi, to Sumitomo Chemical Company, Limited. Production of ketone by reaction of ester or thiol ester with grignard reagent. 3,867,453, Cl. 260-570.0AB.

Muller, Helmut: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 3,867,340.

Muller, Horst, to Swiss Aluminium Ltd. Separator. 3,867,116, Cl. 55-319.000.

Muller, Hubert, to SIEMAG Siegener Maschinenbau GmbH. Rolling mill. 3,866,454, Cl. 72-238.000.

Muller, Johann, deceased (by Muller, Katharina, legal representative), to Friedrich Deckel Atiengesellschaft. Universal drilling and milling machine with several exchangeable toolheads. 3,867,054, Cl. 408-234.00R.

Muller, Katharina, legal representative: *See—*
Muller, Johann, deceased, 3,867,054.

Muller, Rolf: *See—*
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Muller, Siegfried: *See—*
Heuser, Helmut; Stupp, Winfried; Penz, Heinz; Rose, Walter; and Muller, Siegfried, 3,866,291.

Mulligan, Robert J., to Richardson-Merrell Inc. Hinged box. 3,866,793, Cl. 220-31.00S.

Murakami, Masuo; Kawata, Ryuichi; Kawamura, Shigeo; Takamura, Shuichi; Hirano, Takayoshi; and Tomuro, Kouji, to Yamanouchi Pharmaceutical Co., Ltd. Process for the preparation of suspensions of microcrystals of chloramphenicol palmitate. 3,867,414, Cl. 260-404.500.

Muravchik, Mariam Efimovna: *See—*
Aliev, Vagab Safarovich; Kasimova, Adilya Khanum Panakh Kyzy; Muravchik, Mariam Efimovna; Ter-Sarkisov, Beniamin Georgievich; and Kyazimov, Shamil Kyazim Ogly, 3,867,471.

Murco Environmental Limited: *See—*
Coffey, Manus, 3,866,778.

Murphy, Jay J.: *See—*
Stedman, Robert N.; Murphy, Jay J.; and Volle, Everette M., 3,866,781.

Murphy, Patrick W. MacKay: *See—*
Elizondo, David Villarreal; Rendon, Armando Reyna; and Murphy, Patrick W. MacKay, 3,866,879.

Murrhardter Waagenfabrik Gebr. Soehnle: *See—*
Soehnle, Karl; Scheerer, Richard; Gutzy, Klaus; Busse, Rido; and Rapp, Reinhold, 3,866,699.

Myers, Gerald L., to Dana Corporation. Fluid operated clutch and brake with dashpot. 3,866,727, Cl. 192-13.00R.

Myerson, Albert L., to Exxon Research and Engineering Company. Method for removing the oxides of nitrogen as air contaminants. 3,867,507, Cl. 423-212.000.

Mylne, John M.: *See—*
Webb, Albert A.; and Tullis, James Paul, 3,866,630.

N. V. Bekaert S. A.: *See—*
Smit, Jacobus Cornelis, 3,866,788.

Nadella: *See—*
Pitner, Alfred, 3,867,050.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,867,465.

Nagai, Nobuyuki: *See—*
Horiuchi, Takefumi; Monju, Yoshiyiki; Tatara, Isamu; Nagai, Nobuyuki; Hisata, Manabu; and Matsumoto, Kiyoshi, 3,867,209.

Naganishi, Hirosuke: *See—*
Narita, Shigeyoshi; Naganishi, Hirosuke; Izumi, Chikashi; Yokouchi, Akiyoshi; and Yamada, Masaru, 3,867,256.

Nagel, George W., to Westinghouse Electric Corporation. Speed responsive clutch. 3,866,731, Cl. 192-104.00C.

Nagel, Leroy: *See—*
Jacobs, Fred L.; and Nagel, Leroy, 3,867,224.

Nagele, Immanuel P., to Coleman Company, Inc., The. Evaporative air conditioner. 3,867,486, Cl. 261-29.000.

Naguro, Kazutaka; and Seya, Takao, to Kawaguchi Seiko Kabushiki Kaisha. Refining process for removing Mo from high-Ni and/or high-Co, Mo-containing alloy steels. 3,867,133, Cl. 75-53.000.

Nakada, Masahiko; Maekawa, Takehiko; and Matsumoto, Hirofumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for supplying secondary air to a gas engine intake manifold. 3,866,588, Cl. 123-124.00R.

Nakamata, Tsuyoshi: *See—*
Inoue, Jiro; Takatori, Ken; and Nakamata, Tsuyoshi, 3,866,952.

Nakamizo, Nobuhiro: *See—*
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, 3,867,424.

Nakamura, Masao; Uchida, Chieko; Ozaki, Masanao; and Ichikawa, Takehiko, to Ajinomoto Co., Inc. Method of preparing phenylalanine. 3,867,436, Cl. 260-518.00R.

Nakamura, Ryuji: *See—*
Fukumoto, Kenichi; and Nakamura, Ryuji, 3,867,156.

Nakamura, Yasuharu: *See—*
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Nakamura, Yasuo: *See—*
Chimura, Kazuya; Ito, Kazuo; Nakamura, Yasuo; and Miyata, Seiji, 3,867,332.
Chimura, Kazuya; Iwata, Hiroshi; Nakamura, Yasuo; and Shiotsuki, Mitsuaki, 3,867,478.

Nakano, Sukenori: *See—*
Wakabayashi, Senzo; Kusaba, Akira; Koyano, Takayuki; Nakano, Sukenori; Kimura, Jin-Ichi; and Oyamada, Akira, 3,866,449.

Nakata, Tadao; Mizutani, Hideaki; Ito, Shinichi; Okada, Mitsuhiko; and Katayama, Nobuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Manually operated shift assembly with restraining action for shifting to reverse. 3,866,488, Cl. 74-475.000.

Nakayama, Hiroyuki: *See—*
Juna, Kiyoshi; Ohdan, Koji; Nakayama, Hiroyuki; and Asada, Kiyohiko, 3,867,351.

Nakayasu, Teruo: *See—*
Endou, Akira; Maeda, Masao; Okumichi, Toshiharu; Nakayasu, Teruo; and Hamada, Takao, 3,867,466.

Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; Moriuchi, Shigenori; Sato, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Holographic reproduction using carbocyanine dye sensitized, fine-grain silver halide emulsions and neon-helium lasers. 3,867,146, Cl. 96-27.00H.

Nalco Chemical Company: *See—*
Frisque, Alvin J., 3,867,330.
Johnson, Carl E., 3,867,311.
Mindick, Morris; and Reven, Lewis E., 3,867,304.

Namikawa, Mamoru: *See—*
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Narita, Shigeyoshi; Naganishi, Hirosuke; Izumi, Chikashi; Yokouchi, Akiyoshi; and Yamada, Masaru, to Hokkaido Sugar Co., Ltd. Method for production of alpha-galactosidase by microorganism. 3,867,256, Cl. 195-11.000.

Nash, Robert Arnold: *See—*
Ritter, Lawrence; and Nash, Robert Arnold, 3,867,528.

Nasser, Benny E.: *See—*
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National Engineering Company: *See—*
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National Packaging Corporation: *See—*
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National Semiconductor Corporation: *See—*
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National Starch and Chemical Corporation: *See—*
Szymanski, Chester D.; and Demartino, Ronald N., 3,867,355.

National Steel Corporation: *See—*
Austin, Lowell W.; and Baker, James N., 3,866,571.

Natoli, Frank S.: *See—*
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Natwig, David L.: *See—*
Skarbo, Roald R.; Galin, Walter E.; and Natwig, David L., 3,867,506.

Naylor, Floyd E.: *See—*
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Nebzydoski, John W.; Brockway, Harry; Patmore, Edwin L.; and Oberender, Frederick G., to Texaco Inc. Lube containing alkyl ammonium thiocyanate. 3,867,297, Cl. 252-47.500.

Nechitailo, Igor Afanasievich: *See—*
Pavlov, Anatoly Petrovich; Bogomolov, Vladimir Matveevich; Kupershmidt, Felix Borisovich; Nechitailo, Igor Afanasievich; Nosilov, Nikolai Nikolaevich; and Levin-Kogan, Isaak Zalmanovich, 3,866,673.

Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer: *See—*
Meijer, Geertruida M.; Ritter, Fridolin J.; Minks, Albert K.; Voerman, Simon; and Persoons, Cornelis J., 3,866,349.

Neely, James Speer; and Thompson, James Anthony, to Procter & Gamble Company, The. Compositions of matter containing paramethoxycinnamaldehyde as a flavoring agent and sweetener. 3,867,557, Cl. 426-175.000.

Neilsen, Hildaur L. Deburring device. 3,866,452, Cl. 72-211.000.

Nelson, Charles C. Suspension for utility trailer. 3,866,935, Cl. 280-43.230.

Nelson, John R., to Petty-Ray Geophysical, Inc. Color monitor for continuous process control. 3,867,039, Cl. 356-178.000.

Nelson, Melvin A.; Davies, Terence J.; and Clark, John C., to United States of America, Atomic Energy Commission. Fast data acquisition system. 3,867,627, Cl. 250-199.000.

Nelson, Raymond A.: *See—*
O'Connor, James M.; Nelson, Raymond A.; and Hunter, Gary L., 3,866,541.

Nelsson, Nels, to United States Gypsum Company. Metal clad gypsum walls. 3,866,376, Cl. 52-493.000.

Neumeier, Gunter F.: *See—*
Dorazio, Alton, Jr.; Altenburger, Otto; and Neumeier, Gunter F., 3,867,583.

Nevard, William Kenningale. Golf club carrier. 3,866,646, Cl. 150-1.500.

Neville, Richard E. G., to AMF Incorporated. Gas heated rotary drier. 3,866,335, Cl. 34-133.000.

New Age Mirror and Tile Industries, Inc.: *See—*
Ashenfarb, Sidney, 3,867,013.

New Brunswick Scientific Co., Inc.: *See—*
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New Nippon Electric Co., Ltd.: *See—*
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Newby, David R.: *See—*
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Newell, Jon Albert; Seeley, Robert Dudley; and Robbins, Ernest Aleck, to Anheuser-Busch, Incorporated. Process of making yeast protein isolate having reduced nucleic acid content. 3,867,255, Cl. 195-5.000.

Newell, Jon Albert; Robbins, Ernest Aleck; and Seeley, Robert Dudley, to Anheuser-Busch, Incorporated. Manufacture of yeast protein isolate having a reduced nucleic acid content by an alkali process. 3,867,555, Cl. 426-60.000.

Newton Chambers & Company Limited: *See—*
Maudsley, Russell J., 3,867,457.

Newton, Kenneth C.: *See—*
Kraus, Peter E.; and Newton, Kenneth C., 3,866,509.

Nichols, Elton F.; Moorhead, John P.; and Wubbe, Leo J., to Anderson Company, The. Windshield wiper blade connector. 3,866,259, Cl. 15-250.320.

Nicholson, John H.; and Jemison, William, to Heyman Manufacturing Company. Cord anchorage securing device and secure cord anchorage. 3,866,870, Cl. 248-56.000.

Nicholson Manufacturing Company: *See—*
Lunn, Edward O., 3,866,843.

Nickerson, John D.: *See—*
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Nicklas, James R., to Bradley Corporation. Static pressure piston operated diverter mechanism. 3,866,629, Cl. 137-608.000.

Nijman, John Peter, to Bunker Ramo Corporation. Apparatus for electrically terminating insulated conductors in insulation-piercing contact portions of an electrical connector. 3,866,293, Cl. 29-203.0DT.

Nilsson, Jan: *See—*
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Nippon Electric Company, Limited: *See—*
Ichiki, Eiichi; Iida, Kazuo; Ogura, Masato; Seki, Yasuo; and Asanabe, Sizuo, 3,867,202.

Nippon Gakki Seizo Kabushiki Kaishi: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Miyata, Akira; Okubo, Hideyo; Tomita, Chikayoshi; Suzuki, Akio; and Ito, Hidenobu, 3,867,266.
Mori, Toshihiro; and Ando, Seigo, 3,867,689.
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Wakabayashi, Senzo; Kusaba, Akira; Koyano, Takayuki; Nakano, Sukenori; Kimura, Jin-Ichi; and Oyamada, Akira, 3,866,449.

Nippon Oil Seal Industry Co., Ltd.: *See—*
Nishikubo, Tadatomi; Imamura, Yoshinori; Tomiyama, Yoshiko; and Maki, Kiyoshi, 3,867,318.

Nishikubo, Tadatomi; Imamura, Yoshinori; Tomiyama, Yoshiko; and Maki, Kiyoshi, to Nippon Oil Seal Industry Co., Ltd. Photosensitive polymeric esters produced by the condensation of a chloromethyl groups-containing polymer with a carboxyl salt. 3,867,318, Cl. 260-2.00A.

Nitz, Rolf-Eberhard: *See—*
Raabe, Thomas; Stachel, Aldolf, deceased; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,867,389.

Noguchi Fountain and Plaza, Inc.: *See—*
Noguchi, Isamu, 3,866,832.

Noguchi, Isamu, to Noguchi Fountain and Plaza, Inc. Nozzle assembly for producing an internally illuminated water column. 3,866,832, Cl. 239-18.000.

Noguchi, Satoshi: *See—*
Iida, Shuichi; Hayashi, Takao; Noguchi, Satoshi; and Furuuchi, Shigemasa, 3,867,015.

Noll, Ewald: *See—*
Hensel, Jorg; Lussling, Theodor; Noll, Ewald; Schaefer, Hans; and Weigert, Wolfgang, 3,867,438.
Koberstein, Edgar; Luessling, Theodor; Noll, Ewald; Schaefer, Hans; and Weigert, Wolfgang, 3,867,345.

Noll, Klaus: *See—*
Pedain, Josef; Noll, Klaus; Konig, Klaus; and Thoma, Wilhelm, 3,867,350.

Norcross, John L. Apparatus for inserting fibers into a surface. 3,866,290, Cl. 29-203.00V.

Norddeutsche Seekabelwerke Aktiengesellschaft: *See—*
Urban, Horst, 3,867,630.

Nordeen, Erwin E., to Whirlpool Corporation. One piece switch holder and foot operated hinge actuator for vacuum cleaner switch. 3,867,591, Cl. 200-52.00R.

Northern Electric Company, Limited: *See—*
Simonsen, Karlo Buchvaldt, 3,867,576.

Norton, James F., to Hansen Manufacturing Company, The. Plug assembly. 3,866,957, Cl. 285-316.000.

Nosilov, Nikolai Nikolaevich: *See—*
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Nystrand, Ernst Daniel, to Paper Converting Machine Company. Method for producing laminated embossed webs. 3,867,225, Cl. 156-209.000.

Nyul, Paul, to RCA Corporation. High density light emitting diode array. 3,867,666, Cl. 313-500.000.

Oakes, Vincent: *See—*
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Obata, Atsushi; and Namikawa, Mamoru, to Tokushu Seiko Co., Ltd.; and Tokyo Magnetic Printing Co., Ltd. Magnetic card apparatus. 3,866,827, Cl. 235-61.11D.

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Oberg, Karl-Erik: *See—*
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Obermayer, Arthur S.: *See—*
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O'Connor, James M.; Nelson, Raymond A.; and Hunter, Gary L., to O'Connor, James M.; and Goodfellow, Donald M. Self-propelled floor cleaning apparatus with movable brush. 3,866,541, Cl. 15-50.00R.
Oestmann, Eldon D.: *See—*
Whitehurst, Gerald E.; and Oestmann, Eldon D., 3,866,580.
O'Farrell, Charles P.; and Higgins, John J., to Exxon Research and Engineering Company. Adhesive cements containing a sulfonated derivative of butyl rubber and laminates therefrom. 3,867,247, Cl. 161-88.000.
Ogawa, Masaya, to Minolta Camera Kabushiki Kaisha. Electrophotographic copier of transfer type. 3,867,026, Cl. 355-8.000.
Ogden, Gloria F.: *See—*
Ogden, Grant M., Jr., 3,866,532.
Ogden, Grant M., Jr., to Ogden, Gloria F. Firehose retractor. 3,866,532, Cl. 100-171.000.
Ogren, Harvey D.: *See—*
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Ogura, Masato: *See—*
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Ohdan, Koji: *See—*
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Ohlsson, Folke E. H. Sitting furniture and structural units therefor. 3,866,976, Cl. 297-445.000.
Ohtani, Tetsuro, to New Nippon Electric Co., Ltd. Hybrid microwave heating apparatus. 3,867,607, Cl. 219-10.550.
Ohwa, Toshio; Taketomi, Kosaku; Tanaka, Osamu; Sakai, Bunshiro; Taira, Tadaaki; and Hirabayashi, Kiyoteru, to Kobe steel, Ltd.; and Nippon Kokan Kabushiki Kaisha. Submerged arc welding process for very low-temperature steel and welded product. 3,867,608, Cl. 219-73.000.
Ohya, Masahiro: *See—*
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Oil Dynamics, Inc.: *See—*
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O'Keeffe, Terence W.; and Simon, Alan J., to Westinghouse Electric Corporation. Making of micro-miniature electronic components by selective oxidation. 3,867,148, Cl. 96-36.200.
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Okuno, Takeshi: *See—*
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Okuno, Yositosi: *See—*
Ueda, Kenzo; Mizutani, Toshio; Itaya, Nobushige; and Okuno, Yositosi, 3,867,542.
Oleck, Stephen M.; and Stover, William A., to Mobil Oil Corporation. Catalyst composition for removing noxious components from a gaseous stream. 3,867,309, Cl. 252-455.00R.
Olin Corporation: *See—*
Gambardella, Mario A.; and Natoli, Frank S., 3,867,320.
Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., 3,866,451.
Olin, John F.; and Hamm, Philip C., to Monsanto Company. Herbicidal meta-bifunctional benzenes. 3,867,426, Cl. 260-472.000.
O'Link, Maurice H., to Stearns Manufacturing Company. Buoyant pelleted material and method. 3,867,236, Cl. 161-145.000.
Oliver, Burton L.; and Sitler, Wayne R., to International Business Machines Corporation. Dynamic power supply test system. 3,867,618, Cl. 235-153.0AC.
Olson, Lloyd J., to Chevron Research Company. Hydrocracking process using improved Pd-on-silica-alumina catalyst. 3,867,278, Cl. 208-111.000.
Oltman, Fay W.: *See—*
Moore, James G.; and Oltman, Fay W., 3,866,756.
Olympus Optical Co., Ltd.: *See—*
Furihata, Hiroyuki, 3,866,602.
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased (by Childs, Patricia M., executrix), to Riverside Press, Inc. Voting machine. 3,866,826, Cl. 235-54.00A.
Onikov, Eduard Arshakovich: *See—*
Rutkevich, Zinovy Yakovlevich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and German, Roman Anatolievich, 3,866,634.
Oolitic Ground Limestone Co., Inc.: *See—*
Potter, Howard E., 3,866,887.
Opitz, John M., Sr. Airplane wheel rotator. 3,866,860, Cl. 244-103.00S.
Original Equipment Motors Inc.: *See—*
Holper, Frank, 3,866,986.
Orlando, Joseph M.; Katz, Harry S.; and Rainford, Jack W., to Identimation Corporation. Imprinting device having conformable film with wet applied ink for the formation of finger and footprints. 3,867,164, Cl. 117-500.
Orlov, Gennady Ivanovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.
Orshansky, Elias, Jr., to Orshansky Transmission Corporation. Split power transmission. 3,866,490, Cl. 74-687.000.
Orshansky Transmission Corporation: *See—*
Orshansky, Elias, Jr., 3,866,490.
Ortega, Robert. Check valve and check indicator. 3,867,289, Cl. 210-95.000.
Orwin, Olaf John Barclay, to Gib Precision Limited. Overload clutch. 3,866,728, Cl. 192-56.00R.
Osborn, James E.: *See—*
Marci, Vincent C.; Osborn, James E.; and Watkins, David F., 3,866,922.
Oshima, Shintaro; Watanabe, Teruji; Fukui, Takasuke; and Suzuki, Shinzuo, to Kokusai Denshin Denwa Kabushiki Kaisha. Highly directional parametric magnetic sensor. 3,867,690, Cl. 324-43.00R.
Oswalt, Harry L., Jr. Metal working machine. 3,866,522, Cl. 72-324.000.
Otis Engineering Corporation: *See—*
Laky, Tibor, 3,866,679.
Ott, Fred L.: *See—*
Smith, Hubert Irvin; and Ott, Fred L., 3,866,468.
Ott, Jack J.; Matthews, Russell E.; and Lawrence, Garth D., to Dow Chemical Company, The. Impregnation of porous body with metal. 3,867,177, Cl. 117-51.000.
Otto, Charles W., to General Electric Company. Dynamoelectric machine stator. 3,867,654, Cl. 310-42.000.
Outboard Marine Corporation: *See—*
Burmeister, Dennis N.; and Yourich, Adolph J., 3,866,591.
Overby, Robert E.: *See—*
Weed, Robert P.; Rosenberg, Gary; Bourkland, Quentin; and Overby, Robert E., 3,867,582.
Owens-Corning Fiberglas Corporation: *See—*
Bebart, James A., 3,867,117.
Rood, Leonard D.; and Kissell, Ronald E., 3,867,494.
Russell, Robert G., 3,867,118.
Oxel, Berton R., to Hoover Company, The. Toaster with warming rack. 3,866,525, Cl. 99-357.000.
Oxy Metal Finishing Corporation: *See—*
Brown, Henry; Tomaszewski, Thaddeus W.; and Clauss, Richard J., 3,866,289.
Brown, Henry; and Boycott, William A., 3,867,267.
Oyamada, Akira: *See—*
Wakabayashi, Senzo; Kusaba, Akira; Koyano, Takayuki; Nakano, Sukenori; Kimura, Jin-Ichi; and Oyamada, Akira, 3,866,449.
Ozaki, Masanao: *See—*
Nakamura, Masao; Uchida, Chieko; Ozaki, Masanao; and Ichikawa, Takehiko, 3,867,436.
Ozimek, Chester E.; and Eldridge, Kenneth L., Jr., to Sears, Roebuck and Co. Manual typewriter with means for error correction. 3,866,736, Cl. 197-181.000.
P. D. Springall Limited: *See—*
Riach, Allan; and Sinclair, Thomas, 3,866,362.
P. R. Mallory & Co., Inc.: *See—*
Holmes, Robert W., 3,867,201.
Pacheco, Daniel: *See—*
Dobeus, William J.; Cheetham, James V.; Pacheco, Daniel; Keyzer, Carl A.; and Sandrock, Don G., 3,866,942.
Pacini, Elmo J.; Johnson, Alford H.; and Turner, Robert B., Jr., to Deaderich and Royster Inc. Adjustable spool and spool system. 3,866,327, Cl. 33-125.00R.
Packautomatic GmbH & Co. K.G., Firma: *See—*
Timmerbeil, Karl-Ernst, 3,866,395.
Page, William H. Coated polymeric fibers. 3,867,179, Cl. 117-76.00F.
Paixao, Leonel M.: *See—*
Vitale, Peter T.; and Paixao, Leonel M., 3,867,249.
Paletzki, Hans Joachim, to Georgetown Steel Corp. Billet twister. 3,866,762, Cl. 214-1.0QG.
Pall Corporation: *See—*
Pall, David B.; and Jasaitis, Tadas K., 3,867,294.
Pall, David B.; and Jasaitis, Tadas K., to Pall Corporation. Cylindrical filter elements with improved side seam seal. 3,867,294, Cl. 210-489.000.
Palmer, Harold S. Conveying apparatus for a material handling vehicle. 3,866,770, Cl. 214-83.200.
Palomo, Manuel W. Container cap with trap dispensing means. 3,866,797, Cl. 221-263.000.
Pannier, Karl A., Jr.: *See—*
Reynolds, Gordon S.; and Pannier, Karl A., Jr., 3,866,608.

Paoli, Charles. Air cushion vehicle flexible skirt arrangement. 3,866,707, Cl. 180-127.000.

Paper Converting Machine Company: *See—*
Nystrand, Ernst Daniel, 3,867,225.

Paramount Glass Mfg. Co. Ltd.: *See—*
Kasuga, Kesaharu; Abe, Takeo; and Haga, Tsunehiro, 3,867,119.

Paris, Gerard Yvon; and Swett, Leo Ralph, to Abbott Laboratories. 1-Methyl-4,5-di(p-methoxyphenyl)-6h-pyrrolo(2,3-c) pyrazole. 3,867,402, Cl. 260-310.00R.

Parker-Hannifin Corporation: *See—*
Paul, John C., 3,866,419.
Sturgess, Geoffrey J., 3,866,413.

Parkins, Derek Ray: *See—*
Garrett, Roy Peter; Parkins, Derek Ray; and Kiener, Heinz, 3,866,732.

Parr, William Geoffrey. Former for moulding garments. 3,866,807, Cl. 223-68.000.

Partyka, Michael J. Boat loader of the side mounting type. 3,866,776, Cl. 214-450.000.

Pascal, Pierre J.: *See—*
Bernard, Jean Claude; and Pascal, Pierre J., 3,866,288.

Pasternak, Stephen F., to Peerless of America, Incorporated. Method of making a finned tube heat exchanger having a circular cross section. 3,866,286, Cl. 29-157.30A.

Patmore, Edwin L.: *See—*
Nebzydoski, John W.; Brockway, Harry; Patmore, Edwin L.; and Oberender, Frederick G., 3,867,297.

Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich. Method for electroslag remelting of consumable electrodes. 3,867,130, Cl. 75-10.00R.

Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased (by Schelkunova, Margarita Petrovna, administrator). Electrode holder of three phase electroslag plant. 3,867,561, Cl. 13-12.000.

Patrick, Thomas R.; and Keahey, Joe H., to Texas Instruments Incorporated. Wide angle viewing system for limited visibility conditions. 3,867,633, Cl. 250-334.000.

Patterson, N. Donald: *See—*
Sorensen, Robert; Scarnato, Thomas J.; and Patterson, N. Donald, 3,867,064.

Patton, Bobbie Joe, to Mobil Oil Corporation. Torque assist for logging-while-drilling tool. 3,867,714, Cl. 340-18.0LD.

Paul, John C., to Parker-Hannifin Corporation. Integrated pressure compensated load sensing system. 3,866,419, Cl. 60-427.000.

Paulke, Heinz. Tile assembly. 3,866,379, Cl. 52-593.000.

Paull, David, to Swiss Aluminium Ltd. Reversible sill assembly with a positive fluid drain. 3,866,369, Cl. 52-209.000.

Paulsen, Lewis A., to Edward C. Levy Company. Dust sampling system. 3,867,640, Cl. 250-573.000.

Pavlov, Anatoly Petrovich; Bogomolov, Vladimir Matveevich; Kupershmidt, Felix Borisovich; Nechitailo, Igor Afanasievich; Nosilov, Nikolai Nikolaevich; and Levin-Kogan, Isaak Zalmanovich. Heat exchanger for cooling ore cinders. 3,866,673, Cl. 165-120.000.

Pawletko, Joseph P.: *See—*
Chai, Hi D.; and Pawletko, Joseph P., 3,867,676.

Pawluczyk, Romuald. Holographic microscope with suppression of coherent noise. 3,867,009, Cl. 350-3.500.

Payne, Marion A.: *See—*
Payne, Marion L.; and Payne, Marion A., 3,866,496.

Payne, Marion L.; and Payne, Marion A. Sheetboard cutting machines. 3,866,496, Cl. 83-471.300.

Paynter, John D.; and Bunting, William M., to Exxon Research and Engineering Company. Reforming with Pt-Ir catalysts promoted by either Bi or Fe. 3,867,280, Cl. 208-139.000.

Pazos, Hector V. Apparatus for raising underwater propulsion elements above a floating waterline. 3,866,562, Cl. 115-41.00R.

Pearce, Henry A., Jr., to Westinghouse Electric Corporation. Gas detector for fluid-filled electrical apparatus. 3,866,460, Cl. 73-19.000.

Pearce, Larry Neil, to Baxter Laboratories, Inc. Liquid filling apparatus. 3,866,635, Cl. 141-45.000.

Peberdy, Roland, to Bentley Engineering Company, Ltd., The. Composite sliders. 3,866,441, Cl. 66-14.000.

Pedain, Josef; Noll, Klaus; Konig, Klaus; and Thoma, Wilhelm, to Bayer Aktiengesellschaft. Polyurethane urea elastomers based on polycarbonate macrodiols. 3,867,350, Cl. 260-77.5AM.

Pedersen, Vernon: *See—*
Sinks, Allen J.; Shearer, Gordon T.; and Pedersen, Vernon, 3,866,253.

Peeling, John E., Jr., to SCM Corporation. Process and compositions for porcelain enameling. 3,867,157, Cl. 106-48.000.

Peerless of America, Incorporated: *See—*
Pasternak, Stephen F., 3,866,286.

Peil, Archie W.: *See—*
Slator, Damon T.; and Peil, Archie W., 3,866,954.

Pelino, Angel: *See—*
Gill, Charles L., 3,866,660.

Penfold, Robert J.; Talke, Frank E.; and Thompson, Paul A., to International Business Machines Corporation. Multiple flexible disk file. 3,867,723, Cl. 360-98.000.

Pennwalt Corporation: *See—*
Callahan, John William; and Capdevielle, Martin John, 3,866,357.

Pentegov, Igor Vladimirovich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Penz, Heinz: *See—*
Heuser, Helmut; Stupp, Winfried; Penz, Heinz; Rose, Walter; and Muller, Siegfried, 3,866,291.

Per Frisk, Karl, to Barracudaverken Aktiebolag. Pole system. 3,866,619, Cl. 135-15.0PQ.

Perfect Module Systems, Inc.: *See—*
De Schutter, Camiel R., 3,866,377.

Pering, Richard D.; and Hall, James A., to Hewlett-Packard Company. Controlled signal receiver. 3,867,707, Cl. 329-132.000.

Perkins, Neale A., to Safariland Leather Products. Spring-loaded belt keeper. 3,866,276, Cl. 24-259.00A.

Perrin, John W. Relative movement responsive siren alert. 3,867,719, Cl. 340-33.000.

Perry, Thomas E., to Republic Steel Corporation. Method of deslagging molten metal. 3,867,132, Cl. 75-49.000.

Persoons, Cornelis J.: *See—*
Meijer, Geertruida M.; Ritter, Fridolin J.; Minks, Albert K.; Voerman, Simon; and Persoons, Cornelis J., 3,866,349.

Peter, Bernd: *See—*
Rabus, Friedrich; Peter, Bernd; and Eisele, Hermann, 3,866,979.

Peterson, Charles M.: *See—*
Peterson, Harry S., Jr.; Peterson, Charles M.; and King, Robert, III, 3,866,384.

Peterson, Eric J. Automobile service lane with servicing pit. 3,866,624, Cl. 137-234.600.

Peterson, Harry S., Jr.; Peterson, Charles M.; and King, Robert, III, to Harry A. Peterson Company, Inc. Method of forming crack control slots. 3,866,384, Cl. 52-744.000.

Peterson, Robert A., to Raytheon Company. Microwave heating apparatus for rotatable articles. 3,867,606, Cl. 219-10.550.

Petrolite Corporation: *See—*
Quinlan, Patrick M., 3,867,286.

Petros, Andrew J., to Mesta Machine Company. Mill roll changing system including a roll buggy. 3,866,455, Cl. 72-239.000.

Petty-Ray Geophysical, Inc.: *See—*
Nelson, John R., 3,867,039.

Pfahl, Robert Christian, Jr.; and Ammann, Hans Hugo, to Western Electric Company, Incorporated; and Bell Telephone Laboratories, Incorporated. Method for soldering, fusing or brazing. 3,866,307, Cl. 29-498.000.

Pfeuffer, Anton. Apparatus for continuous production of syrup. 3,867,195, Cl. 127-22.000.

Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,867,415.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H. Substituted xanthone carboxylic acid compounds. 3,867,407, Cl. 260-335.000.

Pfizer Inc.: *See—*
Cross, Peter Edward; and Gadsby, Brian, 3,867,390.
Holland, Gerald F., 3,867,391.

Phillips, Carroll D., to United States of America, Navy. Hand-held control means. 3,867,600, Cl. 200-157.000.

Phillips Petroleum Company: *See—*
Borenstein, David E., 3,867,187.
Campbell, Robert W., 3,867,356.
Cheng, Paul J., 3,867,100.
Edmonds, James T., Jr., 3,867,189.
Guillory, Jack P.; Becker, Ralph S.; and Hughes, William B., 3,867,342.
Hsieh, Henry L.; Buck, Ollie G.; and Naylor, Floyd E., 3,867,353.
Krejci, Joseph C., 3,867,513.
Scoggins, Lacey E., 3,867,357.
Smith, Ernest L., 3,866,818.
Stoller, Frederick L., 3,867,243.
Witt, Donald R.; and Nasser, Benny E., 3,867,306.

Phillips, William, to RCA Corporation. Novel lithium niobate single crystal film structure. 3,867,012, Cl. 350-96.0WG.

Photovolt Corporation: *See—*
Gilbert, Jack J., 3,867,273.

Pickard, George L.: *See—*
Brown, Gaylord W.; and Pickard, George L., 3,867,088.

Pickens, Herman Leon; and Miller, Thomas P., to Terra Corporation. Quick disconnect for telecommunication lines. 3,867,588, Cl. 179-175.30R.

Pilkington Brothers Limited: *See—*
Berry, Ronald Frank, 3,866,906.

Pimentel, Daniel R.: *See—*
Graf, Paul E.; and Pimentel, Daniel R., 3,867,594.

Pines, Seemon H., to Merck & Co., Inc. Preparation of 7-acylamido-7-methoxy-3-substituted methyl-3(or 2)-cephem-4-carboxylic acid and its s-oxides. 3,867,378, Cl. 260-243.00C.

Pioneer Electronic Corporation: *See—*
Maekawa, Kouji; and Tamura, Yutaka, 3,867,586.
Yamamuro, Isao, 3,867,587.

Pioneer Laboratories, Inc.: *See—*
Jones, Edward W., 3,866,566.

Pitner, Alfred, to Nadella, a part interest. Assembly of a connecting element and a torque transmitting element. 3,867,050, Cl. 403-373.000.

Pitre, Davide: *See—*
Felder, Ernst; Pitre, Davide; and Zutter, Hans, 3,867,431.

Pitts, Thomas Edgar: *See—*
Golm, Gunter G.; and Pitts, Thomas Edgar, 3,866,278.

Pittsburgh Corning Corporation: *See—*
Krouskop, Ned C., 3,867,498.

Pitzalis, Mario: *See—*
Vargiu, Silvio; Pitzalis, Mario; and Crespolini, Giancarlo, 3,867,346.

Pivard, Claude: *See—*
Simonet, Guy; and Pivard, Claude, 3,866,428.

Pizzigoni, Alfred, to Stephen Horbach and Company. Integrated circuit breadboard module. 3,867,672, Cl. 317-101.0CC.

Plant, William J.; and Szwarc, John J., to Freeman Chemical Corporation. Method of making multiple layer light transmissive laminates. 3,867,222, Cl. 156-107.000.

Plessis, Jean Max, to Commissariat a l'Energie Atomique. Capacitive probe rotated by air pressure and used to measure internal diameter of a cylilnder. 3,867,691, Cl. 324-61.00R.

Plough, Russell H., to Symons Corporation: Brace lock assembly for scaffolding. 3,867,043, Cl. 403-49.000.

Podola, Nikolai Vasilievich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Podola, Nikolai Vasilievich; Bondarenko, Oleg Petrovich; Leibenzon, Semen Abramovich; Kaganovsky, Gary Petrovich; Smolyakov, Vadim Filimonovich; Eltsov, Konstantin Sergeevich; Gabuev, Georgy Kharitonovich; and Gladky, Dmitry Fedorovich, 3,867,130.

Polaroid Corporation: *See—*
Ell, Robert J., 3,867,023.

Poletti, Genarose J., to Raymond Lee Organization, Inc., The. Rugs with detachable sections. 3,866,267, Cl. 16-8.000.

Polichtechnika Warszawska: *See—*
Marciniak, Zdzislaw; and Kopacz, Zeonon, 3,866,450.

Pollard, Theodore O., to International Product Development Incorporated. Modular structure for use in merchandising operations. 3,866,364, Cl. 52-36.000.

Pollet, Robert Joseph: *See—*
Vanden Eynde, Hector Alfons; Pollet, Robert Joseph; and De Cat, Arthur Henri, 3,867,451.

Polysciences, Inc.: *See—*
Halpern, Benjamin D.; and Akkapeddi, Murali Krishna, 3,867,329.

Pommerening, Uwe A., to Stromberg-Carlson Corporation. Universal night service circuit. 3,867,581, Cl. 179-18.0BD.

Porret, Daniel: *See—*
Habermeier, Jurgen; and Porret, Daniel, 3,867,385.

Porter, Carl D., to Fried, E. Victor. Apparatus for forming a golf ball mold. 3,867,078, Cl. 425-78.000.

Porterfield, Hancel W. Sparger Waste. 3,867,488, Cl. 261-87.000.

Post Office, The: *See—*
Greathead, Thomas William, 3,866,740.
Ritchie, William Kerr, 3,866,447.

Postenrieder, Erwin: *See—*
Diermayer, Alphons; Kutzner, Luitpold; Postenrieder, Erwin; and Diermayer, Werner, 3,866,594.

Potapov, Alexei Ivanovich: *See—*
Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich, 3,867,208.

Potter, Bernard Alan, to Lucas Electric Co., Ltd., The. Method of connecting two parts. 3,867,609, Cl. 219-150.00V.

Potter, Howard E., to Oolitic Ground Limestone Co., Inc. Vertically integrated asphalt plant. 3,866,887, Cl. 259-154.000.

Potter, Howell L., to Textron Inc. Locking device for a bearing. 3,866,989, Cl. 308-236.000.

Potters Industries Inc.: *See—*
Ritter, James R.; and Strauch, Otto R., 3,867,178.

Potts, James E.: *See—*
Clendinning, Robert A.; Potts, James E.; and Cornell, Stephen W., 3,867,324.

Pounds, R. Harold. Footboard for hospital bed. 3,866,251, Cl. 5-327.00R.

Powell, Alvin S.: *See—*
Boyd, Elmer E.; and Powell, Alvin S., 3,866,938.

Powell, Jeffrey David, to Teaching Concepts, Inc. Game apparatus. 3,866,919, Cl. 273-135.0AC.

Powers, James W.; and Manning, Roger L. Method for molding candles of varying configuration. 3,867,501, Cl. 264-219.000.

Powers, Joseph A.: *See—*
Crouser, Darwin S.; and Powers, Joseph A., 3,866,263.

Pozar, Frank A.: *See—*
Mastriani, Elvin A.; and Pozar, Frank A., 3,866,853.

PPG Industries, Inc.: *See—*
Bohl, Lester E.; Rogerson, Roy H.; and Stroke, Frederick G., 3,867,515.
Bowers, Bobby O.; and Brzozowski, Stanley F., 3,867,505.
Fahey, Dennis M., 3,867,328.
Trevorrow, Thomas R.; and Graff, Kenneth R., 3,867,121.

Prater, Earle F., to Roberts Consolidated Industries, Inc. Carpet stretcher with telescoping tubing locking device. 3,866,964, Cl. 294-8.600.

Precision Valve Corporation: *See—*
Stevens, Silvester William, 3,866,804.

Prentice, Winslow W.; and Malootian, Markay H., to United States of America, Navy. Electrical conductive coated cable. 3,867,565, Cl. 174-120.0SC.

Prescott, Charles: *See—*
Gordon, Bernard M.; Becker, Brant W.; and Prescott, Charles, 3,866,302.

President of Osaka University, the Ministry of Education, Japanese Government, The: *See—*
Shimonishi, Yasutsugu; and Takahashi, Satomi, 3,867,269.

Pressman, Gerald L.: *See—*
Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., 3,867,673.

Prete, Ernest, Jr.; and Knox, Howard T., to Ancra Corporation. Strap tensioning buckle. 3,866,272, Cl. 24-68.0CD.

Priddy, Duane B., to Dow Chemical Company, The. Preparation of Phenolic carboxylic acid esters. 3,867,427, Cl. 260-473.00S.

Priem, Jan Jozef; De Winter, Walter Frans; and Lambrechts, Jan Bernard, to Agfa-Gevaert N.V. Photographic silver halide material. 3,867,152, Cl. 96-63.000.

Primak, William L., to United States of America, Atomic Energy Commission. Method of producing a lithium-depleted patterned surface on a lithium niobate crystal. 3,867,185, Cl. 117-118.000.

Prince Corporation: *See—*
McNeil, Gary, 3,866,271.
Wunder, William G., 3,866,666.

Princeton Applied Research Corporation: *See—*
Coor, Thomas, 3,867,620.

Princeton Bank and Trust Co., executor: *See—*
Williams, Richard; and Willis, Alfred Henry, deceased, 3,867,165.

Pringle, William L., to William L. Pringle & Associated, Inc. Disc brake parking feature. 3,866,721, Cl. 188-72.600.

Procter & Gamble Company, The: *See—*
Darragh, Richard T.; and Stone, James L., 3,867,556.
Neely, James Speer; and Thompson, James Anthony, 3,867,557.

Progl, Rudolph, to Textron Inc. Guide bar adjustment for chain saw. 3,866,320, Cl. 30-386.000.

Prokai, Bela: *See—*
Morehouse, Edward L.; and Prokai, Bela, 3,867,420.

Pry, Hugh E.: *See—*
Auman, Paul M.; Bower, John E., Jr.; and Pry, Hugh E., 3,866,664.

Pugh, Cecil C.; and Ringer, Ronald L., to General Motors Corporation. Meniscus control insert for automatic ice maker water fill tube. 3,866,434, Cl. 62-340.000.

Pugin, Andre: *See—*
von der Crone, Jost; Model, Ernst; and Pugin, Andre, 3,867,404.

Pundt, Dieter; and Schmelzer, Gunther, to Volkswagenwerk Aktiengesellschaft. Mixture control system for an internal combustion engine with controlled injection fuel. 3,866,583, Cl. 123-97.00B.

Pundt, Dieter: *See—*
Bigalke, Erhard; and Pundt, Dieter, 3,866,584.

Purdy, David L.; Magovern, George J.; and Smyth, Nicholas, to Coratomic Inc. Heart pacer. 3,866,616, Cl. 128-419.00P.

Puskarz, Stanley J.; and Lattke, Horst G., to Emhart Corporation. Wrap-around packer. 3,866,391, Cl. 53-159.000.

Putzer, Raymond M., to Lenox Candles, Inc. Method of decorating objects with wax. 3,867,173, Cl. 117-39.000.

Quaintance, Laythol W., to Harry M. Rubenstein. Electric heating apparatus for heating a liquid by electrical conduction. 3,867,610, Cl. 219-286.000.

Quellos, Antonio Sala. Stop motion swtich for controlling thread tension in a textile machine. 3,867,592, Cl. 200-61.180.

Quick Service Textiles, Inc.: *See—*
Miller, Samuel E., 3,867,242.

Quinlan, Patrick M., to Petrolite Corporation. Use of polyquaternary ammonium methylene phosphonates to chelate or inhibit formation of scale. 3,867,286, Cl. 210-58.000.

R. F. Vanderbilt Company, Inc.: *See—*
Beadle, Howard C., 3,867,359.

R. H. Dreshman & Sons, Inc.: *See—*
Dreshman, Roy H., 3,866,484.

R. P. Scherer Corp.: *See—*
Miskel, John J.; and Hom, Foo Song, 3,867,521.

Raabe, Thomas; Stachel, Aldolf, deceased (by Stachel, Ingeburg Lydia Katharina, heiress); Scholtholt, Josef; and Nitz, Rolf-Eberhard, to Cassela Farbwerke Mainkur Aktiengesellschaft. Alpha-(n-benzoyloxy and phenylamino alkyl-piperazino)-beta-benzoyl-propionic acid derivatives. 3,867,389, Cl. 260-268.00R.

Rabus, Friedrich; Peter, Bernd; and Eisele, Hermann, to Robert Bosch G.m.b.H. Fail safe vehicle wheel braking anti-lock system. 3,866,979, Cl. 303-21.0AF.

Rabus, Friedrich: *See—*
Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, 3,866,980.

Rabussier, Bernard: *See—*
Hennart, Claude; Mandon, Jean-Pierre; Martin, Georges; and Rabussier, Bernard, 3,867,526.

Radler, Richard William: *See—*
Bergfjord, John Alf; Grammatica, Steven James; and Radler, Richard William, 3,867,141.

Raffelson, Harold; and Suda, Michael, to Monsanto Company. P-v-fe catalyst modified with chromium for production of maleic anhydride from saturated aliphatic hydrocarbons. 3,867,411, Cl. 260-346.80A.

Rahaim, Thomas J.: *See—*
Schaller, Richard J.; Rahaim, Thomas J.; and Booher, Claude R., Jr., 3,867,065.

Rainford, Jack W.: *See—*
Orlando, Joseph M.; Katz, Harry S.; and Rainford, Jack W., 3,867,164.

Rains, John K.: *See—*
Weber, Ronald A.; and Rains, John K., 3,866,628.

Raitzyn, Isidore: *See—*
Trebillon, Emile; and Raitzyn, Isidore, 3,867,362.

Ramsey, Ira E.; and Fishbaugh, Byron L., to Goodyear Tire & Rubber Company, The. Single contact actuator assembly. 3,867,595, Cl. 200-86.00R.

Rank Organisation Limited, The: *See—*
Thomas, Alan John, 3,866,476.

Rank Xerox, Ltd.: *See—*
Honjo, Satoru; and Miyazuka, Hajime, 3,867,145.

Rapistan Incorporated: *See—*
Zollinger, Howard A.; and Lubbers, Le Roy, 3,866,767.

Rapp, Reinhold: *See—*
Soehnle, Karl; Scheerer, Richard; Gutzy, Klaus; Busse, Rido; and Rapp, Reinhold, 3,866,699.

Rappoport, Leonid Iosifovich: *See—*
Krasik, Yakov Lvovich; Rappoport, Leonid Iosifovich; Gelbin, Anatoly Nikolaevvich; Marsjuk, Nikolai Andreevich; Gura, Anatoly Nikitovich; and Kirichenko, Boris Mefodievich, 3,867,669.

Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, to Ciba-Geigy Corporation. Nickel stabilisers for synthetic polymers. 3,867,340, Cl. 260-45.75N.

Ratcliff, Ronald R.; Watts, John F.; and Simonson, Alden D., to Boeing Company, The. Fire-safe aircraft refuse disposal system. 3,866,861, Cl. 244-118.00P.

Raterman, Donald E.; and Goebel, Joseph, to Addressograph Multigraph Corporation. Microfiche viewer-printer machine. 3,867,025, Cl. 355-5.000.

Rattenberry, John E., to Raymond Lee Organization, Inc., The, a part interest. Aerial photographic mapping apparatus. 3,866,858, Cl. 244-32.000.

Rauscher, Werner, to Wandel u Goltermann. Monitoring circuitry for amplitude-measuring system. 3,867,694, Cl. 324-102.000.

Raygo, Inc.: *See—*
Barrett, John C.; and Larson, Roger L., 3,867,073.

Rayle, Billy D.: *See—*
Reid, Lloyd W.; Rayle, Billy D.; and Flinchum, Harold C., 3,866,771.

Raymond, Eugene B. An improved electrical current measuring meter having integral calibration and zero adjustment means. 3,867,696, Cl. 324-146.000.

Raymond Lee Organization, Inc., The: *See—*
Billman, Harry E., 3,867,622.
James, Edwin E., 3,866,809.
Poletti, Genarose J., 3,866,267.
Rattenberry, John E., 3,866,858.
Steward, John, 3,866,560.

Raytheon Company: *See—*
Braun, Martin; Doolittle, Howard D.; Barrett, Harrison H.; Sage, Jay P.; and Wilson, David T., 3,867,637.
Peterson, Robert A., 3,867,606.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 3,867,685.
Alphonse, Gerard Argant; and Bodeep, George Edward, 3,867,108.
Endriz, John Guiry, 3,867,662.
Lee, Wendell Maurice, 3,867,144.
Nyul, Paul, 3,867,666.
Phillips, William, 3,867,012.
Shrader, Terry Monroe, 3,867,668.
Weimer, Paul Kessler, 3,867,645.
Williams, Richard; and Willis, Alfred Henry, deceased, 3,867,165.
Wojslawowicz, Jack Edward, 3,867,651.

Reed, Delmer H.; and Seltzer, Edward C., to Union Carbide Corporation. Tape joint cement additive. 3,867,335, Cl. 260-42.520.

Reed, Samuel F., Jr.: *See—*
Stevens, Trevis E.; and Reed, Samuel F., Jr., 3,867,213.

Reed Tool Company: *See—*
Stanley, John M., 3,866,698.

Reese, Murray C. Truck bed cover assembly. 3,866,972, Cl. 296-137.00B.

Reflex Corporation of Canada Limited: *See—*
Birrell, Stewart Hector, 3,866,802.

Regie Nationale des Usines Renault: *See—*
Lecailtel, Pierre, 3,867,053.

Reich, Elmar, to Liebherr, Hans. Rotary tower crane. 3,866,760, Cl. 212-144.000.

Reid, Lloyd W.; Rayle, Billy D.; and Flinchum, Harold C., to Reid's Trailer Inc. Vehicle loading ramp displacement apparatus. 3,866,771, Cl. 214-85.000.

Reid, Luther J., Jr.: *See—*
Suryanarayana, Yelagondahally S.; and Reid, Luther J., Jr., 3,867,382.

Reid's Trailer Inc.: *See—*
Reid, Lloyd W.; Rayle, Billy D.; and Flinchum, Harold C., 3,866,771.

Reifenberg, Gerald H.; and Considine, William J., to M & T Chemicals Inc. Use of stannane as a reducing agent. 3,867,463, Cl. 260-618.00H.

Reimer, Richard W. Rotary engine. 3,866,578, Cl. 123-8.450.

Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the releasing of materials from voluminous precipitates or suspensions. 3,867,197, Cl. 134-25.00R.

Reliance Electric Company: *See—*
Lambert, George M., 3,866,789.

Rendon, Armando Reyna: *See—*
Elizondo, David Villarreal; Rendon, Armando Reyna; and Murphy, Patrick W. MacKay, 3,866,879.

Rengren, Wayne E., to GTE Automatic Electric Laboratories Incorporated. Do-not-disturb adapter for telephone receivers. 3,867,584, Cl. 179-84.00C.

Republic Steel Corporation: *See—*
Perry, Thomas E., 3,867,132.

Research Corporation: *See—*
Denton, Medona Bonner, 3,866,831.

Reuner, Horst: *See—*
Frank, Rudolf; Reuner, Horst; and Ulm, Klaus, 3,867,316.

Reven, Lewis E.: *See—*
Mindick, Morris; and Reven, Lewis E., 3,867,304.

Rey, Jean Paul, to S.I.E.P.E.M. Diagnostic and therapeutic apparatus for cosmetically and hygienically treating skin. 3,866,600, Cl. 128-2.10R.

Reynolds, Brian E.; and Carson, John R., to McNeil Laboratories, Incorporated. Diazepinoindoles. 3,867,374, Cl. 260-239.30T.

Reynolds, Gordon S.; and Pannier, Karl A., Jr., to Sorenson Research Co., Inc. Aseptic suction collection system and method. 3,866,608, Cl. 128-276.000.

Rheinmetall GmbH: *See—*
Germershausen, Raimund; Schmitt, Jochen; and Witt, Wolfram, 3,867,089.
Hornfeck, Josef; and Bartolles, Rolf, 3,866,513.

Rhone-Progil: *See—*
Trebillon, Emile; and Raitzyn, Isidore, 3,867,362.

Riach, Allan; and Sinclair, Thomas, to P. D. Springall Limited. Lawn mover sharpening attachment. 3,866,362, Cl. 51-250.000.

Rice, Delong, Jr. Prestressed shaft gripping element. 3,867,049, Cl. 403-344.000.

Rice, James E., to Goodyear Tire & Rubber Company, The. Suppression of vibration in rotating discs. 3,866,977, Cl. 301-5.00R.

Rice, James E.: *See—*
Marshall, Richard P.; Rice, James E.; and Stokes, James D., 3,866,465.

Rich, Frank D., Jr.; and McDonald, Alexander D., to F. D. Rich Housing Corporation. Building. 3,866,672, Cl. 165-50.000.

Richard, James W., to Missouri-Kansas-Texas Railroad Company. Swing deck locking device. 3,866,543, Cl. 105-368.00R.

Richards, Edward L.; and Dobrosielski, Stephen S., to Westinghouse Electric Corporation. Control switch. 3,867,598, Cl. 200-153.00G.

Richards, Louis R.: *See—*
Carbon, Thomas J.; Zeisberger, Josef T.; Richards, Louis R.; and Lekan, Henry N., 3,866,741.

Richardson-Merrell Inc.: *See—*
Albrecht, William L.; and Fleming, Robert W., 3,867,409.
Mulligan, Robert J., 3,866,793.
Shemano, Irving, 3,867,531.

Richen Co., Inc., The: *See—*
Kennedy, Harry R., 3,866,279.

Richman, Paul, to SMC Microsystems Corporation. Method for selectively establishing regions of different surface charge densities in a silicon wafer. 3,867,196, Cl. 148-1.500.

Ricks, Michael James, to Imperial Chemical Industries Limited. Oxychlorination process. 3,867,469, Cl. 260-659.00A.

Ricoh Co., Ltd.: *See—*
Yanagawa, Nobuyuki, 3,866,755.

Riddell Inc.: *See—*
Morgan, Gerard E., 3,866,243.

Ridder, Georg Sven Olof: *See—*
Bergstrom, Lars Rune; and Ridder, Georg Sven Olof, 3,866,558.

Ridout, David E. U. Vapor deposition apparatus with rotating drum mask. 3,866,565, Cl. 118-49.100.

Riew, Changkiu K., to B. F. Goodrich Company, The. Production of epihalohydrin polymer latex. 3,867,321, Cl. 260-17.4ST.

Rifi, Mahmoud R., to Union Carbide Corporation. Water-dilutable coating compositions containing maleinized oil and resole. 3,867,323, Cl. 260-19.00R.

Rigassi, Norbert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,867,415.

Rikker, Leslie D.; and Suckfuell, Gerhard A., to National Engineering Company. Mixer with automatically controlled discharge system. 3,866,799, Cl. 222-63.000.

Riley, Raymond C. Boot and shoe drying device. 3,867,611, Cl. 219-523.000.

Ringer, Ronald L.: *See—*
Pugh, Cecil C.; and Ringer, Ronald L., 3,866,434.

Ringerud, Chester A. Air-operated hand tool. 3,866,493, Cl. 81-57.110.

Rishton, Michael L.: *See—*
Curless, Richard W.; Federico, Armando; Magro, Alfred E.; and Rishton, Michael L., 3,866,604.

Ritchie, William Kerr, to Post Office, The. Apparatus and method for straightening tubes. 3,866,447, Cl. 72-9.000.

Ritter, Fridolin J.: *See—*
Meijer, Geertruida M.; Ritter, Fridolin J.; Minks, Albert K.; Voerman, Simon; and Persoons, Cornelis J., 3,866,349.

Ritter, James R.; and Strauch, Otto R., to Potters Industries Inc. Method for coating discrete particles. 3,867,178, Cl. 117-69.000.

Ritter, Lawrence; and Nash, Robert Arnold, to American Cyanamid Company. Steroidal topical cream base. 3,867,528, Cl. 424-241.000.

Rittig, Falk: *See—*
Beutel, Peter; Jung, Johann; and Rittig, Falk, 3,867,482.

Riverside Press, Inc.: *See—*
O'Neal, Cothburn M.; Mayo, Alfred M.; and Childs, George William, deceased, 3,866,826.

Rivin, Donald; and Cotten, George R., to Cabot Corporation. Precipitated silica reinforcing agents and rubber compositions containing same. 3,867,326, Cl. 260-37.00N.

Ro-Search, Incorporated: *See—*
Liebscher, Anton I., 3,866,256.

Robalex, Inc., Trustee: *See—*
Bemiss, Robert P., 3,866,816.

Robbins, Ernest Aleck: *See—*
Newell, Jon Albert; Seeley, Robert Dudley; and Robbins, Ernest Aleck, 3,867,255.
Newell, Jon Albert; Robbins, Ernest Aleck; and Seeley, Robert Dudley, 3,867,555.
Sucher, Robert William; Robbins, Ernest Aleck; Sidoti, Daniel Robert; Schuldt, Erich Henry, Jr.; and Seeley, Robert Dudley, 3,867,554.

Robbins, Ralph C. Compositions and methods for disaggregating blood cells. 3,867,541, Cl. 424-283.000.

Robert Bosch G.m.b.H.: *See—*
Aldinger, Ulrich, 3,866,517.
Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, 3,866,980.
Haubner, Georg; and Schmaldienst, Peter, 3,866,589.
Kersten, Gunter; Fricke, Hans-Jurgen; and Veil, Karl, 3,866,421.
Kersten, Gunter, 3,866,422.
Knapp, Heinrich, 3,866,587.
Rabus, Friedrich; Peter, Bernd; and Eisele, Hermann, 3,866,979.

Robert Krause KG Zweiniederlassung Weilheim/Teck: *See—*
Kneile, Karl, 3,866,866.

Roberts Consolidated Industries, Inc.: *See—*
Prater, Earle F., 3,866,964.

Roberts, Dennis A., to Time Computer, Inc. Solid state electronic wristwatch. 3,866,406, Cl. 58-4.00A.

Robinson, Glen: *See—*
Larralde, Edward; and Robinson, Glen, 3,866,696.

Robison, Gary A., to Bombardier Limited. Motorcycle steering head angle adjustment. 3,866,946, Cl. 280-279.000.

Roby, John H.; and Denlinger, Roger R., to Kusan, Inc. Toy insect. 3,866,348, Cl. 46-22.000.

Rockford Automation, Inc.: *See—*
Minkwitz, Joachim P. C., 3,866,537.

Rockland, Louis B.; and Debenedict, Charles R., to United States of America, Agriculture. Production of terpeneless essential oils. 3,867,262, Cl. 203-41.000.

Rockwell International Corporation: *See—*
Moore, Keith A., 3,867,514.
Stoffer, C. Daniel, 3,867,699.

Rockwell Manufacturing Company: *See—*
Stelljes, Charles R., 3,866,692.

Rockwool Aktiebolaget: *See—*
Haglund, Ulf Karl Henrik, 3,867,241.

Rody, Jean: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 3,867,340.

Rogers, John E., Jr. Resilient supporting structure for relief of pressure. 3,866,252, Cl. 5-345.00R.

Rogerson, Roy H.: *See—*
Bohl, Lester E.; Rogerson, Roy H.; and Stroke, Frederick G., 3,867,515.

Rohatgi, Pradeep Kumar, to Bethlehem Steel Corporation. Method of making synthetic resin composites with magnetic fillers. 3,867,299, Cl. 252-62.540.

Rohlfs, John H., to Jamieson Manufacturing Company. Apparatus for machining chuck jaw elements. 3,866,309, Cl. 29-563.000.

Rohm and Haas Company: *See—*
Seidel, Michael C.; Von Meyer, William C.; and Greenfield, Stanley A., 3,867,395.
Whang, Jong Jai, 3,867,481.

Rohr, Wolfgang: *See—*
Kiefer, Hans; Mueller, Albrecht; Koenig, Karl-Heinz; Rohr, Wolfgang; and Adolphi, Heinrich, 3,867,428.

Rojd, Johan Esbjorn: *See—*
Claesson, Tore Vilhelm; and Rojd, Johan Esbjorn, 3,866,504.

Ronneau, Gerard S.; Debacker, Pierre D.; and Carpentier, Hugo L., to Metallurgie Hoboken-Overpelt. Anodically oxidizable metal powder. 3,867,129, Cl. 75-0.5BB.

Rood, Leonard D.; and Kissell, Ronald E., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing fiber reinforced organic foam. 3,867,494, Cl. 264-45.300.

Roper, Charles R.: *See—*
Roper, William H.; Roper, Robert E.; and Roper, Charles R., 3,866,791.

Roper, Frank: *See—*
Roper, William H.; Roper, Robert E.; and Roper, Charles R., 3,866,791.

Roper, Robert E.: *See—*
Roper, William H.; Roper, Robert E.; and Roper, Charles R., 3,866,791.

Roper, William H.; Roper, Robert E.; and Roper, Charles R., to Roper, Frank; and Miller, Ralph A., part interest to each. Container and cover including corner pouring and bail nesting features. 3,866,791, Cl. 220-95.000.

Rose, Walter: *See—*
Heuser, Helmut; Stupp, Winfried; Penz, Heinz; Rose, Walter; and Muller, Siegfried, 3,866,291.

Rosenberg, Gary: *See—*
Weed, Robert P.; Rosenberg, Gary; Bourkland, Quentin; and Overby, Robert E., 3,867,582.

Rosenberry, George Mowry, Jr.: *See—*
Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William Russell, 3,866,661.

Rossfelder, Andre M.; and Bates, William S., to Tetra Tech, Inc. Drilling system. 3,866,697, Cl. 175-5.000.

Rothell, Floyd W. Trailer bulkhead. 3,866,544, Cl. 105-376.000.

Rothmayer, Noel Y.; MacKeand, James Crawford B.; and Smith, Clark W., to Allied Chemical Corporation. Refrigeration system. 3,866,427, Cl. 62-7.000.

Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syntex Associates, a/k/a Syva Company. Opiate imidates and protein conjugates thereof. 3,867,366, Cl. 260-121.000.

Rubin, Jack A., to United States of America, Atomic Energy Commission. Method of producing an oxidation-resistant UO_2 Fuel Body. 3,867,489, Cl. 264-0.500.

Ruck, Heinz E., to Fibre-Metal Products Co., The. Headgear structure for welding helmets and the like. 3,866,244, Cl. 2-8.000.

Rudszinat, Willy; Baier, Anton; Heitmann, Uwe; and Brand, Peter, to Hauni-Werke Korber & Co., KG. Means for reducing noise in tobacco processing machines or the like. 3,866,708, Cl. 181-33.00R.

Rupp, Wiktor J., to Itek Corporation. Method and apparatus for generating toroidal surfaces. 3,866,358, Cl. 51-33.00R.

Ruscus, Paul V. Swimmer detection system for remote or local deployment. 3,867,711, Cl. 340-5.00R.

Russell, James A. Telescopic speculum. 3,866,601, Cl. 128-4.000.

Russell, Paul F.: *See—*
Foster, E. Gordon; Russell, Paul F.; and Vanderwater, Robert G., 3,867,113.

Russell, Robert G., to Owens-Corning Fiberglas Corporation. Apparatus for production of glass fibers. 3,867,118, Cl. 65-12.000.

Russell, Stanley L., to Stromberg-Carlson Corporation. Receiving circuits for digital signal distribution systems. 3,867,580, Cl. 179-16.0EA.

Rust, John B.; and Smolker, Gary S., to Hughes Aircraft Company. Electrolytic anticompromise apparatus. 3,867,272, Cl. 204-194.000.

Rutkevich, Zinovy Yakovlevich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and German, Roman Anatolievich. Shedding motion for loom. 3,866,634, Cl. 139-79.000.

Rutledge, James L., to Motorola, Inc. Manufacture of semiconductor devices. 3,867,204, Cl. 148-188.000.

Rzepczyk, Henryk, to Coleco Industries, Inc. Player pieces for vibratory game apparatus. 3,866,915, Cl. 273-85.00R.

Rzeszewski, Theodore S., to Motorola, Inc. Vertical interval reference signal extraction circuit arrangement. 3,867,010, Cl. 358-10.000.

S.A. Francois Salomon & Fils: *See—*
Salomon, Georges Pierre Joseph, 3,866,930.

S.I.E.P.E.M.: *See—*
Rey, Jean Paul, 3,866,600.

Sadir, Richardo: *See—*
Freedman, David; and Sadir, Richardo, 3,867,260.

Safariland Leather Products: *See—*
Perkins, Neale A., 3,866,276.

Saffran, Helmut: *See—*
Brand, Erich; and Saffran, Helmut, 3,867,410.

Sagane, Masahiko, to Kansai Paint Co., Ltd. Liquid crystal composition for electric field indication. 3,867,016, Cl. 350-160.0LC.

Sage, Jay P.: *See—*
Braun, Martin; Doolittle, Howard D.; Barrett, Harrison H.; Sage, Jay P.; and Wilson, David T., 3,867,637.

Sage, Warnie L.; and Scott, Edwin D., to Babcock and Wilcox Company, The. Ignitor. 3,867,092, Cl. 431-354.000.

Saint-Gobain Industries: *See—*
Fournier, Yves, 3,866,875.

St-Jean, Guy, to Institut de Recherche de l'Hydro-Quebec (Ireq). Multi-frequency tuned h.v. synthetic circuit for testing circuit breakers. 3,867,686, Cl. 324-28.0CB.

Saito, Takashi: *See—*
Tanaka, Hiroshi; and Saito, Takashi, 3,867,143.

Sakai, Bunshiro: *See—*
Ohwa, Toshio; Taketomi, Kosaku; Tanaka, Osamu; Sakai, Bunshiro; Taira, Tadaaki; and Hirabayashi, Kiyoteru, 3,867,608.

Sakharov, Boris Alexandrovich: *See—*
Rutkevich, Zinovy Yakovlevich; Sakharov, Boris Alexandrovich; Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; and German, Roman Anatolievich, 3,866,634.

Salem Corporation: *See—*
Solano, William E., 3,867,261.

Salles, Henri J.; and Newby, David R., to National Semiconductor Corporation. Method of providing electrically isolated overlapping metallic conductors. 3,866,311, Cl. 29-578.000.

Salmin, Valery Vasilievich: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Salomon, Georges Pierre Joseph, to S.A. Francois Salomon & Fils. Safety releasable ski binding. 3,866,930, Cl. 280-11.35T.

Salsgiver, James A., to Allegheny Ludlum Industries, Inc. Process for forming sheet material with excellent surface characteristics. 3,866,301, Cl. 29-412.000.

Sanada, Tomohiro: *See—*
Egawa, Mitsuru; Akahane, Masahiro; and Sanada, Tomohiro, 3,866,829.

Sanders, Andrew A.: *See—*
Lay, Lowell B., Jr.; and Sanders, Andrew A., 3,867,695.

Sandnaes, Per Christian. Ship construction. 3,866,556, Cl. 114-41.000.

Sandoz-Wander, Inc.: *See—*
Boyajy, Louis D.; and Gogerty, John H., 3,867,532.
Houlihan, William J., 3,867,381.
Houlihan, William J.; and Nadelson, Jeffrey, 3,867,465.
Simpson, William R., 3,867,387.

Sandrock, Don G.; and Kline, Roy E., to Fiat-Allis Construction Machinery, Inc. Operator's compartment with swinging window. 3,866,969, Cl. 296-28.00C.

Sandrock, Don G.: *See—*
Dobeus, William J.; Cheetham, James V.; Pacheco, Daniel; Keyzer, Carl A.; and Sandrock, Don G., 3,866,942.

Sandvik Aktiebolag: *See—*
Claesson, Tore Vilhelm; and Rojd, Johan Esbjorn, 3,866,504.
Lundgren, Evert Gustav, 3,866,282.

Sanga, Yasuhiro. Combustion furnace. 3,866,551, Cl. 110-8.00R.

Sano, Kazuya: *See—*
Imai, Shinichi; and Sano, Kazuya, 3,867,458.

Sanroma, Ulises Canellas, to Firestone Tire & Rubber Company, The. Alpha crystalline lattice polyamides containaing sodium phosphinate and a calcium salt. 3,867,339, Cl. 260-45.70R.

Santilli, Arthur A.: *See—*
Kim, Dong H.; and Santilli, Arthur A., 3,867,386.

Santora, Norman J.: *See—*
Diamond, Julius; and Santora, Norman J., 3,867,435.

Sanwa Kagaku Kenkyusho Co. Ltd.: *See—*
Fujimura, Hajime; Suzuki, Kenju; Asano, Osamu; and Asai, Masaru, 3,867,437.

Sarff, Ronald E.: *See—*
Freese, Gary P.; and Sarff, Ronald E., 3,866,742.

Sarukahanian, Georg; and Kruger, Manfred. Dehumidifier for air utilized in laundry drying. 3,866,333, Cl. 34-75.000.

Sato, Akira: *See—*
Nakazawa, Yoshiyuki; Nakamura, Yasuharu; Sueyoshi, Tohru; Moriuchi, Shigenori; Sato, Akira; and Ikeda, Tadashi, 3,867,146.

Sato, Kunito; and Herring, Harold K., to Armour and Company. Preserving red color in fresh raw uncured red meats. 3,867,558, Cl. 426-265.000.

Sato, Masanori: *See—*
Miyao, Takayaki; Maeda, Hiroaki; and Sato, Masanori, 3,866,519.
Miyao, Takayuki; Maeda, Hiroaki; Sato, Masanori; and Motoyama, Hiroshi, 3,866,518.

Sato, Yozo: *See—*
Kasahara, Mikio; and Sato, Yozo, 3,866,622.

Saunders, Allan L., to Automatic Radio Mfg. Co., Inc. Cartridge eject mechanism for tape players and the like. 3,867,721, Cl. 360-93.000.

Saxenmeyer, George J., Sr., to International Business Machines Corporation. LSI chip test probe contact integrity checking circuit. 3,867,693, Cl. 324-73.00R.

Sayward, Richard W.: *See—*
Long, Olan L.; and Sayward, Richard W., 3,867,107.

Sazonova, Tamara Nikolaevna: *See—*
Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich, 3,867,208.

Scainetti, Jack P. Tennis-stroke practice target combination. 3,866,912, Cl. 273-29.00A.

Scarnato, Thomas J.: *See—*
Sorensen, Robert; Scarnato, Thomas J.; and Patterson, N. Donald, 3,867,064.

Schadow, Rudolf. Alternate make-break pushbutton switch assembly with detent means, indicator and indicator slide switch structure. 3,867,596, Cl. 200-153.00J.

Schaefer, Hans: *See—*
Hensel, Jorg; Lussling, Theodor; Noll, Ewald; Schaefer, Hans; and Weigert, Wolfgang, 3,867,438.
Koberstein, Edgar; Luessling, Theodor; Noll, Ewald; Schaefer, Hans; and Weigert, Wolfgang, 3,867,345.

Schaefer, Howard A. Roadway marker and method of making it. 3,867,120, Cl. 65-62.000.

Schaefer, Karl. Knife for a wood-shaving machine. 3,866,643, Cl. 144-241.000.

Schaefer, Richard J. Process for treating cutting and cooling oils. 3,867,288, Cl. 210-60.000.

Schaerf, Henry C. Disposable portable double-bottom-lift handled carton. 3,866,821, Cl. 229-52.00B.

Schaffer, William G., to Gates Rubber Company, The. Reinforced hose and method. 3,866,632, Cl. 138-130.000.

Schaller, Richard J.; Rahaim, Thomas J.; and Booher, Claude R., Jr., to Westinghouse Electric Corporation. Ceramic insulator for a gas turbine blade structure. 3,867,065, Cl. 415-214.000.

Scheer, Lawrence E.: *See—*
Elkins, Paul A.; Miller, Ralph A.; and Scheer, Lawrence E., 3,866,734.

Scheer, Marcel: *See—*
Kaiser, Ado; Koch, Wolfgang; Scheer, Marcel; and Wolcke, Uwe, 3,867,441.

Scheerer, Richard: *See—*
Soehnle, Karl; Scheerer, Richard; Gutzy, Klaus; Busse, Rido; and Rapp, Reinhold, 3,866,699.

Schelkunov, Jury Andreevich, deceased: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Schelkunova, Margarita Petrovna, administrator: *See—*
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Pentegov, Igor Vladimirovich; Baglai, Vitaly Mikhailovich; Bondarenko, Oleg Petrovich; Medvedenko, Nikolai Fedorovich; Medovar, Boris Izrailevich; Loskutov, Pavel Petrovich; Orlov, Gennady Ivanovich; Khasin, Kim Moiseevich; Lugovsky, Vladimir Ivanovich; Salmin, Valery Vasilievich; Marjuschenko, Vilen Fedorovich; Tamozhnikov, Georgy Vasilievich; and Schelkunov, Jury Andreevich, deceased, 3,867,561.

Scherber, Werner: *See—*
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Scherzer, Julius; and Albers, Edwin W., to W. R. Grace & Co. Exchanged faujasite. 3,867,307, Cl. 252-455.00Z.

Schexnayder, Lawrence F., to Caterpillar Tractor Company. Valve assembly having a pressure responsive detent mechanism. 3,866,880, Cl. 251-297.000.

Schick, Mary Margaret, to du Pont de Nemours, E. I., and Company. Product and process. 3,867,180, Cl. 117-76.0FB.

Schiele, August: *See—*
Uhl, Siegfried; and Schiele, August, 3,866,514.

Schimkat, Harald: *See—*
Lincke, Wolfgang; Zimdahl, Walter; Andreas, Peter; Schimkat, Harald; and Kuhlborn, Hans, 3,866,706.

Schimmer, Rigobert: *See—*
Gesing, Horst; Schimmer, Rigobert; and Streit, Manfred, 3,867,203.

Schinke, Heinz Joachim; and Uhing, Hans-Dieter, to Mathias Bauerle GmbH, Firma. Automatic printing machine. 3,866,534, Cl. 101-144.000.

Schley, Robert, to Commissariat a l'Energie Atomique. Refractory metal hot-junction thermocouple. 3,867,205, Cl. 136-232.000.

Schlinger, Warren G.: *See—*
Marion, Charles P.; Schlinger, Warren G.; Brent, Albert; and Muenger, James R., 3,866,411.

Schlosser, Rudolf: *See—*
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Schmaldienst, Peter: *See—*
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Schmeisser, Gerhard: *See—*
Seamone, Woodrow; and Schmeisser, Gerhard, 3,866,246.

Schmelzer, Gunther: *See—*
Pundt, Dieter; and Schmelzer, Gunther, 3,866,583.

Schmid, Richard G.; and Schwartz, Otto H., to Zenith Radio Corporation. Single knob, multifunction control assembly for a television receiver. 3,866,477, Cl. 74-10.450.

Schmidt, Henry, Jr.; and Durham, Bruce, to Industrial Filter & Pump Mfg. Co. Apparatus for cleaning filters. 3,867,291, Cl. 210-139.000.

Schmidt, Peter Jurgen: *See—*
Eisele, Hermann; Kizler, Harald; Gualco, Ardelio; Rabus, Friedrich; Schmidt, Peter Jurgen; Locher, Johannes; and Misch, Wolfgang, 3,866,980.

Schmidtchen, Hans-Martin: *See—*
Cramer, Christoph; Schmidtchen, Hans-Martin; Schwartze, Hans Jurgen; and Eichmeyer, Bernd, 3,866,670.

Schmitt, Edward Emil; and Epstein, Martin, to American Cyanamid Company. Reducing capillarity of polyglycolic acid sutures. 3,867,190, Cl. 117-138.80A.
Schmitt, Hermann: *See—*
Heimberger, Werner; Schmitt, Hermann; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, 3,867,422.
Schmitt, Jochen: *See—*
Germershausen, Raimund; Schmitt, Jochen; and Witt, Wolfram, 3,867,089.
Schmitt, William H., to Alberto Culver Company. Non-pressurized package containing self-heating products. 3,866,800, Cl. 222-94.000.
Schmolka, Irving R. Preparation of aqueous gel compositions containing a water-insoluble organic ingredient. 3,867,533, Cl. 424-258.000.
Schneider, Vernon J. Fishing float. 3,866,346, Cl. 43-44.870.
Schnettler, Richard A.; and Suh, John T. 3[4-(2-Thienoyl)-piperazino]-4,5-dihydro-1h-2,4-benzodiazepines. 3,867,388, Cl. 260-268.0BC.
Schoffmann, Rudolf, to Allis-Chalmers Corporation. Twin strand continuous casting apparatus with a tundish load balancing vessel. 3,866,665, Cl. 164-281.000.
Scholtholt, Josef: *See—*
Raabe, Thomas; Stachel, Aldolf, deceased; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,867,389.
Scholz, William A. Cigarette case. 3,866,747, Cl. 206-94.000.
Schoom, Werner, to Deutsche Gesellschaft fur Schadlingbekampfung GmbH. Pest control unit. 3,866,347, Cl. 43-129.000.
Schoon, David J., to Minnesota Mining and Manufacturing Company. Particle counting apparatus. 3,867,613, Cl. 235-92.0PC.
Schor, Ferdinand William; and Johnson, Tore Rudolf, to AMP Incorporated. Multiple spark gap protective device. 3,867,670, Cl. 317-61.500.
Schora, Frank C.; and Matthews, Charles W., to Institute of Gas Technology. Method of coal pretreatment. 3,867,110, Cl. 48-210.000.
Schreyer, Gerd: *See—*
Heimberger, Werner; Schmitt, Hermann; Schreyer, Gerd; Theissen, Ferdinand; and Weigert, Wolfgang, 3,867,422.
Schroll, Craig R.: *See—*
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Schuierer, Erich: *See—*
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Schuldt, Erich Henry, Jr.: *See—*
Sucher, Robert William; Robbins, Ernest Aleck; Sidoti, Daniel Robert; Schuldt, Erich Henry, Jr.; and Seeley, Robert Dudley, 3,867,554.
Schultz, Forrest O. E., to Midland-Ross Corporation. Suspension system for vehicles. 3,866,895, Cl. 267-65.00D.
Schwab, Frederick C.; and Heilweil, Israel J., to Mobil Oil Corporation. Block copolymers and lubricant compositions containing the same. 3,867,295, Cl. 252-33.400.
Schwantje, Gerd, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Anthraquinoid disperse dyes. 3,867,406, Cl. 260-326.00D.
Schwartz, Otto H.: *See—*
Schmid, Richard G.; and Schwartz, Otto H., 3,866,477.
Schwartze, Hans Jurgen: *See—*
Cramer, Christoph; Schmidtchen, Hans-Martin; Schwartze, Hans Jurgen; and Eichmeyer, Bernd, 3,866,670.
Schwiebert, Phillip D. Twist lock container support. 3,866,970, Cl. 296-35.00A.
Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,867,415.
Scientific Process & Research Inc.: *See—*
Tadmor, Zehev; and Klein, Imrich, 3,866,890.
Scientific Technology Incorporated: *See—*
Brown, Roger M., 3,867,628.
SCM Corporation: *See—*
Peeling, John E., Jr., 3,867,157.
Scoggins, Lacey E., to Phillips Petroleum Company. Arylene sulfide polymers. 3,867,357, Cl. 260-79.100.
Scott, Edwin D.: *See—*
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Scott and Fetzer Company: *See—*
Upton, Albert E., Jr., 3,866,874.
Scott, Milford M., Jr., to STP Corporation. Pollution control device. 3,866,586, Cl. 123-119.00A.
Scott Paper Company: *See—*
Hakanson, Nils L., 3,867,031.
Scrivener, Frank P.: *See—*
Dydzyk, Michael, 3,866,888.
Seaburg, Duane M., to General Electric Company. Brush holder assembly. 3,867,659, Cl. 310-242.000.
Sealectro Corporation: *See—*
Iantorno, James, 3,866,998.
Seamone, Woodrow; and Schmeisser, Gerhard, to United States of America, Navy. Shoulder disarticulation prosthetic system. 3,866,246, Cl. 3-1.100.
Sears, Roebuck and Co.: *See—*
Ozimek, Chester E.; and Eldridge, Kenneth L., Jr., 3,866,736.
Seeley, Robert Dudley: *See—*
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Newell, Jon Albert; Robbins, Ernest Aleck; and Seeley, Robert Dudley, 3,867,555.
Sucher, Robert William; Robbins, Ernest Aleck; Sidoti, Daniel Robert; Schuldt, Erich Henry, Jr.; and Seeley, Robert Dudley, 3,867,554.
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Seidel, Michael C.; Von Meyer, William C.; and Greenfield, Stanley A., to Rohm and Haas Company. 1,2,4-4H-triazole derivatives. 3,867,395, Cl. 260-308.00R.
Seip, Hermann, to ITT Industries, Inc. Load-dependent brake force distributor with a failsafe bypass valve. 3,866,984, Cl. 303-22.00R.
Seki, Kunio; and Kontani, Ryozo, to Hitachi, Ltd. Muting system for power amplifier. 3,867,709, Cl. 330-15.000.
Seki, Tatsujiro, to Sekisui Kaseihia Kogyo Kabushiki Kaisha. Process of producing synthetic wood having a beautiful appearance. 3,867,493, Cl. 264-45.900.
Seki, Yasuo: *See—*
Ichiki, Eiichi; Iida, Kazuo; Ogura, Masato; Seki, Yasuo; and Asanabe, Sizuo, 3,867,202.
Sekisui Kaseihia Kogyo Kabushiki Kaisha: *See—*
Seki, Tatsujiro, 3,867,493.
Seltzer, Edward C.: *See—*
Reed, Delmer H.; and Seltzer, Edward C., 3,867,335.
Serota, Rudolph M., to Bangor Punta Operation, Inc. Dielectric apparatus for and method of treating traveling paper webs and the like. 3,866,255, Cl. 34-1.000.
Serruys, Max. Anti-pollution devices for internal combustion engines. 3,866,579, Cl. 123-25.00A.
Service Business Forms, Inc.: *See—*
Wolfberg, Larry B.; and Harper, John, 3,866,500.
Seya, Takao: *See—*
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Shannon, Jefferson C. Cultivator assembly. 3,866,834, Cl. 239-167.000.
Shapiro, Eugene: *See—*
Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., 3,866,451.
Shapland, Earl P., Jr., to United States Steel Corporation. Operating mechanism for slidable gates and method of operating slide gate. 3,866,806, Cl. 222-504.000.
Shaw, Richard B.; and Carlson, Richard F., to Allegheny Ludlum Industries, Inc. Method for producing stainless steel in a basic oxygen furnace. 3,867,134, Cl. 75-60.000.
Shaw, Robert R.; and Snitzer, Elias, to American Optical Corporation. Neodymium doped borate glass exhibiting fluorescence at 1.06 micrometers. 3,867,303, Cl. 252-301.60P.
Shearer, Gordon T.: *See—*
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Sheeran, Patrick J.: *See—*
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Shell Oil Company: *See—*
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Foster, E. Gordon; Russell, Paul F.; and Vanderwater, Robert G., 3,867,113.
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Van Grinsven, Petrus F. A.; Wieldraaijer, Wim; and Maas, Rudolf J., 3,867,470.
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Shemano, Irving, to Richardson-Merrell Inc. Method of treating conditions of delayed hypersensitivity employing morpholine derivatives. 3,867,531, Cl. 424-248.000.
Shen, Tshung-Ying; and Jones, Howard, to Merck & Co., Inc. Cyclopenta[j,k]-phenanthrene-4-acetic acids and related compounds. 3,867,433, Cl. 260-515.00A.
Shepard, Richard W.; and Ashmead, Albert S., to Torrington Company, The. Felting needle. 3,866,456, Cl. 72-324.000.
Shepherd, Bobby R.: *See—*
Warner, Ronald C.; Shepherd, Bobby R.; Hickok, Ray M.; and Alexander, Charles A., 3,866,393.
Shibata, Osamu; Kojimoto, Susumu; and Okuno, Takeshi, to Sumitomo Chemical Company, Limited. Irrigation hose. 3,866,833, Cl. 239-76.000.
Shifrina, Natalia Petrovna: *See—*
Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich, 3,867,208.
Shikoku Kaken Kogyo Kabushiki Kaisha: *See—*
Fukumoto, Kenichi; and Nakamura, Ryuji, 3,867,156.
Shimizu, Hideo, to Mitsubishi Paper Mills, Ltd. Non-carbon copying upper paper. 3,867,169, Cl. 117-36.200.
Shimodaira, Takashi: *See—*
Kanetka, Junichi; and Shimodaira, Takashi, 3,867,405.
Shimonishi, Yasutsugu; and Takahashi, Satomi, to President of Osaka University, the Ministry of Education, Japanese Government, The. Process for producing peptides. 3,867,269, Cl. 204-158.00S.
Shin-Shirasuna Electric Corporation: *See—*
Syohji, Keisuke, 3,867,722.
Shiotsuki, Mitsuaki: *See—*
Chimura, Kazuya; Iwata, Hiroshi; Nakamura, Yasuo; and Shiotsuki, Mitsuaki, 3,867,478.

Shirai, Tadashi: *See*—
Umezawa, Hamao; Takahashi, Yasushi; Shirai, Tadashi; and Fujii, Akio, 3,867,257.

Shirley, Billie J. Method and apparatus for establishing a packer. 3,866,681, Cl. 166-285.000.

Shoe, Theodore W., to Flexicore Co., Inc., The. Method of stripping slab casting forms. 3,867,503, Cl. 264-313.000.

Shoemaker, Arthur H., to American Optical Corporation. Five component microscope eyepiece. 3,867,018, Cl. 350-216.000.

Shrader, Terry Monroe, to RCA Corporation. Cathode-ray tube having an internal-external magnetic shield and degaussing combination. 3,867,668, Cl. 315-8.000.

Sidoti, Daniel Robert: *See*—
Sucher, Robert William; Robbins, Ernest Aleck; Sidoti, Daniel Robert; Schuldt, Erich Henry, Jr.; and Seeley, Robert Dudley, 3,867,554.

Sieber, Charles W., to United States of America, Navy. Self-deploying variable float pendant. 3,866,561, Cl. 114-235.00B.

Siegel, Bernard: *See*—
Mlavsky, Abraham I.; Bates, Herbert E.; and Siegel, Bernard, 3,867,496.

Siegwart, Hans-Rudolf: *See*—
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SIEMAG Siegener Maschinenbau GmbH: *See*—
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Siemens Aktiengesellschaft: *See*—
Heubeck, Erich, 3,866,973.
Svensson, Bengt, 3,866,614.

Signetics Corporation: *See*—
Cline, Ronald L., 3,867,644.

Sikorski, Thaddeus John, to Standard Metal Products. Free flow device for container unscramblers. 3,866,739, Cl. 198-30.000.

Silina, Elena Petrovna: *See*—
Grekov, Nikolai Alexandrovich; Arkovenko, Galina Ivanovna; Silina, Elena Petrovna; Shifrina, Natalia Petrovna; Sazonova, Tamara Nikolaevna; Kleimenov, Vasily Yakovlevich; Kvater, Josif Sholomovich; Zlatkin, Moisei Grigorievich; Mirmelshtein, Valdislav Alexandrovich; and Potapov, Alexei Ivanovich, 3,867,208.

Simm, Walter, to Agfa-Gevaert Aktiengesellschaft. Process for the electrographic recording of charge images. 3,867,674, Cl. 317-262.00A.

Simon, Alan J.: *See*—
O'Keeffe, Terence W.; and Simon, Alan J., 3,867,148.

Simon, Stefan, to Dr. Carl Hahn GmbH. Method and apparatus for the continuous transfer of longitudinally extending workpieces. 3,866,737, Cl. 198-22.00R.

Simonet, Guy; and Pivard, Claude, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cryogenic separation of an air feed using multi-zone adsorption units. 3,866,428, Cl. 62-18.000.

Simonsen, Karlo Buchvaldt, to Northern Electric Company, Limited. Telephone transmitter circuit. 3,867,576, Cl. 179-1.00A.

Simonson, Alden D.: *See*—
Ratcliff, Ronald R.; Watts, John F.; and Simonson, Alden D., 3,866,861.

Simpson, William R., to Sandoz-Wander, Inc. 2-Alkyl-4-substituted amino-quinazolines and nitrates thereof. 3,867,387, Cl. 260-256.40Q.

Sinclair, Thomas: *See*—
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Singer Company, The: *See*—
Adams, Kenneth D.; and King, Walter F., 3,866,553.
LaRocca, Martin, 3,866,867.

Sinks, Allen J.; Shearer, Gordon T.; and Pedersen, Vernon, to Dacor Corporation. Divers buoyancy vest. 3,866,253, Cl. 9-313.000.

Sinloihi Co.: *See*—
Takano, Ryoshiro; and Miyahara, Sadayasu, 3,867,302.

Sioufi, Amedee. Apparatus for determining the total duration of transitory phenomena. 3,867,615, Cl. 235-92.0TC.

Sippican Corporation, The: *See*—
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Sitler, Wayne R.: *See*—
Oliver, Burton L.; and Sitler, Wayne R., 3,867,618.

Skarbo, Roald R.; Galin, Walter E.; and Natwig, David L., to Kennecott Copper Corporation. Cobalt stripping from oximes. 3,867,506, Cl. 423-139.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Garrett, Roy Peter; Parkins, Derek Ray; and Kiener, Heinz, 3,866,732.

SKF Kugellagerfabriken GmbH: *See*—
Diem, Rudolf, 3,866,775.

Skinner, Frank R., II. Multiple prehension manipulator. 3,866,966, Cl. 294-106.000.

Skoch, Edward L.; Anderson, Sigfried W.; and Slogick, Ronald R., to Versatile Industries, , Inc. Multi-size adapters. 3,866,950, Cl. 285-4.000.

Skonieczny, Raymond S. Variably positionable article and support assembly therefor. 3,866,548, Cl. 108-79.000.

Skrabak, Michal; Vavrik, Ernest; Jadubik, Juraj; and Kolarik, Stanislav. Twin-wire multi-ply paper making machine. 3,867,252, Cl. 162-268.000.

Skuttle Manufacturing Company: *See*—
Yeagle, Richard J., 3,867,485.

Slagel, Edwin C., to Goodyear Aerospace Corporation. Protective shield. 3,866,242, Cl. 2-2.500.

Slator, Damon T.; and Peil, Archie W., to Bowen Tools, Inc. Joint locking device. 3,866,954, Cl. 285-82.000.

Slimak, Lawrence E.: *See*—
Teitelbaum, Bernard R.; and Slimak, Lawrence E., 3,866,473.

Sljusarev, Jury Evgenievich: *See*—
Bulavin, Eduard Grigorievich; and Sljusarev, Jury Evgenievich, 3,867,063.

Sloan, Albert H. Jet water pump apparatus. 3,867,070, Cl. 417-34.000.

Slogick, Ronald R.: *See*—
Skoch, Edward L.; Anderson, Sigfried W.; and Slogick, Ronald R., 3,866,950.

SMC Microsystems Corporation: *See*—
Richman, Paul, 3,867,196.

Smit, Jacobus Cornelis, to N. V. Bekaert S. A. Wire crate. 3,866,788, Cl. 220-19.000.

Smith, Clark W.: *See*—
Rothmayer, Noel Y.; MacKeand, James Crawford B.; and Smith, Clark W., 3,866,427.

Smith, David A.; and Tollefsbol, Werner L., to SmithKline Corporation. Device for testing the torque required to release a screw cap from its tightened position. 3,866,463, Cl. 73-99.000.

Smith, Dexter A.; and Lang, Richard, to Bowen Engineering, Inc. Spray dryer chamber collection system embodying a fluidized bed. 3,867,234, Cl. 159-4.00D.

Smith, Elmer M. Safety device for actuating a brake. 3,866,723, Cl. 188-109.000.

Smith, Ernest L., to Phillips Petroleum Company. Packaging tray. 3,866,818, Cl. 229-30.000.

Smith, Hubert Irvin; and Ott, Fred L., to Drill-Au-Mation, Inc. Drill pipe monitoring systems. 3,866,468, Cl. 73-151.000.

Smith International, Inc.: *See*—
Garner, Lloyd L., 3,866,987.

Smith, Lester L. Pivotal support and guide hardware for folding doors. 3,866,658, Cl. 160-206.000.

Smith, Leward N.: *See*—
Morey, Norval K.; and Smith, Leward N., 3,866,769.

Smith, Stephen Hagar, to McCulloch Corporation. Motor field strength variable brush pressure apparatus and method. 3,867,679, Cl. 318-542.000.

Smith, Thomas R. Drive belt construction. 3,866,483, Cl. 74-231.00C.

Smith, Tom F., to United States T.R.A.D. Corporation. Rack assembly. 3,867,024, Cl. 353-82.000.

Smith, Warren F.: *See*—
Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., 3,866,451.

Smith, William R.: *See*—
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Snyder, Stephen L. Riser controls for gliding parachutes. 3,866,862, Cl. 244-152.000.

Sobel, Jay E.: *See*—
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Soehnle, Karl; Scheerer, Richard; Gutzy, Klaus; Busse, Rido; and Rapp, Reinhold, to Murrhardter Waagenfabrik Gebr. Soehnle. Personnel scale apparatus. 3,866,699, Cl. 177-34.000.

Solano, William E., to Salem Corporation. Fuel incineration system for calciner. 3,867,261, Cl. 202-263.000.

Sommer, Richard; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Dyestuffs containing a (benzenesulphonyl)-substituted sulphonamide first component and an indole first component. 3,867,369, Cl. 260-165.000.

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Spanninger, Philip A., to Goodyear Tire & Rubber Company, The. Thermoplastic linear fiber forming polyester resins having improved anionic dyeability. 3,867,479, Cl. 260-860.000.

Sparks, Charles Howard, deceased (by Sparks, Margaret J., executrix). Graft tubes. 3,866,247, Cl. 3-1.000.

Sparks, Charles Howard, deceased (Sparks, Margaret J., executrix). Apparatus for growing graft tubes in place. 3,866,609, Cl. 128-303.00R.

Sparks, Margaret J., executrix: *See—*
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Sparks, Charles Howard, deceased, 3,866,609.

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Spencer, Donald J., to Westinghouse Electric Corporation. Adjustable damper control mechanism. 3,866,437, Cl. 62-408.000.

Spencer, Willard E., to Boeing Company, The. Wide range pressure controlled spark gap. 3,867,663, Cl. 313-146.000.

Spengler, Ernst. Pull down jaw. 3,866,898, Cl. 269-138.000.

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Stahmann, Mark A.; and Wagle, Sudhakar S., to Kremers-Urban Company. Penicilloyl-polylysine conjugates having dextro-rotary optical activity, and methods for their preparation and use. 3,867,365, Cl. 260-112.500.

Stainer, Arthur Thomas, to Jack Smith (Gunmakers) Limited. Holder for golf ball position marker and a marker therefore. 3,866,749, Cl. 206-234.000.

Stakeman, John S. Apparatus. 3,866,605, Cl. 128-70.000.

Stamicarbon N.V.: *See—*
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Stananought, Leonard William, to Atkinson's of Clitheroe Ltd. Safety guards. 3,866,440, Cl. 64-18.000.

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Stapleton, Johnny R. Dispenser with metering tube having outlet valve. 3,866,801, Cl. 222-146.00C.

Staranick, Steve; and Garrison, Jerome R. Spare tire carrier. 3,866,777, Cl. 214-454.000.

Starkweather, Gary K.; and Damouth, David E., to Xerox Corporation. Flying spot scanner. 3,867,571, Cl. 178-7.600.

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Steigerwald, Carl J., to TRW Inc. Printed circuit edge connector. 3,866,319, Cl. 29-629.000.

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Stemmle, Denis J., to Xerox Corporation. Multiple feed sorting apparatus. 3,866,904, Cl. 271-173.000.

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Stephen Horbach and Company: *See—*
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Stevens, Silvester William, to Precision Valve Corporation. Aerosol valve with pressure relief vent. 3,866,804, Cl. 222-396.000.

Stevens, Trevis E.; and Reed, Samuel F., Jr., to United States of America, Army. Ferrocene-containing monomers and copolymers. 3,867,213, Cl. 149-19.200.

Stevenson, Graham T., to Dow Chemical Company, The. 4-Nitro-4'-(trifluoromethyl) carbanilide employed in animal husbandry. 3,867,544, Cl. 424-322.000.

Steward, John, to Raymond Lee Organization, Inc., The, a part interest. Emergency plug for sealing openings. 3,866,560, Cl. 114-227.000.

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Stone, William M.; and Braunschwig, John M., to General Electric Company. Dynamoelectric machine rotor assembly device and method. 3,866,314, Cl. 29-598.000.

Stoner, Thomas A., to Bucyrus-Erie Company. Method and means for measuring the torque delivered by an electric motor. 3,867,678, Cl. 318-432.000.

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Straube, Elmar, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Diffusion tower construction. 3,867,194, Cl. 127-5.000.

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Sulkowski, Theodore S., to American Home Products Corporation. Imidazolinyl phenyl carbonyl compounds, acid addition salts and related compounds. 3,867,401, Cl. 260-309.600.
Sullivan, James D., to Tycon, S.p.A. Coated metal article and method of making the same. 3,867,166, Cl. 117-23.000.
Sumi, Norio, to Iwatsu Electric Co., Ltd. Process of producing a thin film circuit. 3,867,193, Cl. 117-212.000.
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Svensson, Bengt, to Siemens Aktiengesellschaft. Cardiac actuator. 3,866,614, Cl. 128-419.00P.
Swain, Leonard W.; and Hunter, Edward W., to Emco Limited. Fluidic automatic nozzle. 3,866,637, Cl. 141-226.000.
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Sweet, Phillip J.; Hamlet, Buck C.; and Sweet, David L., to American Carrier Equipment. Air spring unit for suspension systems. 3,866,894, Cl. 267-31.000.
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Szostak, Roland; Maurischat, Guenther; and Krekeler, Ulrich, to Agfa-Gevaert Aktiengesellschaft. Electrostatic copying apparatus. 3,866,573, Cl. 118-637.000.
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Tanaka, Atsuyuki. Film control system by picture frame edge signals of a film. 3,867,030, Cl. 355-41.000.

Tanaka, Hiroshi; and Saito, Takashi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive material. 3,867,143, Cl. 96-1.500.

Tanaka, Kumiko, to Kabushiki Kaisha Daini Seikosha. Crown assembly. 3,866,409, Cl. 58-90.00B.

Tanaka, Osamu: *See*—
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Tanaka, Yoshinobu. Cartridge locking device for tape players. 3,867,720, Cl. 360-93.000.

Taplin Business Machines Incorporated: *See*—
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Taplin, John F.; and Carman, Richard W., to Taplin Business Machines Incorporated. Electro-optical reader for translating print into electric signals. 3,867,572, Cl. 178-7.600.

Tarkowski, Janet. Amusement device. 3,866,647, Cl. 150-30.000.

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Taylor, Challen E., to Goodyear Tire & Rubber Company, The. Hose structure. 3,866,633, Cl. 138-130.000.

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Tegland, Edward R.; and Viger, Howard L., to Texas Instruments Incorporated. Multifold seismic exploration over purposefully crooked traverses. 3,867,713, Cl. 340-15.5CP.

Teich, Horst; and Goppinger, Alois, to Wacker-Chemitronic GmbH. Process of making hollow bodies or tubes of semi-conducting materials. 3,867,497, Cl. 264-81.000.

Teitelbaum, Bernard R.; and Slimak, Lawrence E., to Bendix Corporation, The. Pressure measuring transducer. 3,866,473, Cl. 73-398.0AR.

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Thastrup, Ove, to A/S E. Rasmussen. Axial pipe compensators. 3,866,953, Cl. 285-47.000.

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Thomas, Alan John, to Rank Organisation Limited, The. Analytical apparatus. 3,866,476, Cl. 73-423.00A.

Thompson, David L.; and Wardell, Everett B., to Eastman Kodak Company. Ultrasonic splicing apparatus, method and product. 3,867,232, Cl. 156-502.000.

Thompson, Ira G. Stand device for muscial instrument case. 3,866,877, Cl. 248-359.000.

Thompson, James Anthony: *See*—
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Thompson, Paul A.: *See*—
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Thompson, Stanley P.; and Swearingen, Thomas B. Stack sampling method and apparatus. 3,866,475, Cl. 73-421.50R.

Thorn Electrical Industries Limited: *See*—
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Furmidge, Kenneth Frederick; and Beeson, Eric John George, 3,867,665.

Thorne, John K.; and Sobel, Jay E., to Universal Oil Products Company. Spiral tube mixing device and method of making. 3,866,886, Cl. 259-4.000.

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Todd, Robert R.; and Campbell, Willis R., to Sperry Rand Corporation. Apparatus for controlling the movement of crop material in a roll forming machine. 3,866,531, Cl. 100-88.000.

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Toops, Benny C. Mobile home anchor. 3,866,368, Cl. 52-162.000.

Torck, Bernard. Isomerization of saturated hydrocarbons with hexafluoroantimonic acid and a metal cation. 3,867,476, Cl. 260-683.680.

Torii, Okihiko; Mizunuma, Tsutomu; Mino, Iwao; and Ando, Tetsuya, to Japanese National Railways; and Donki Kagaku Kogyo Kabushiki Kaisha. Cement asphalt ballast grout composition for track. 3,867,161, Cl. 106-96.000.

Torpie, John D.; Bell, Allan J.; Gorham, Michael L.; and Keating, Walter G., to Xerox Corporation. Distortion measuring apparatus. 3,867,702, Cl. 328-163.000.

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Traynor, Edward J., to Westinghouse Electric Corporation. Polyamide-imide film insulation having improved elongation and fold endurance. 3,867,500, Cl. 264-216.000.

Trebillon, Emile; and Raitzyn, Isidore, to Rhone-Progil. Method of telomerizing. 3,867,362, Cl. 260-91.700.

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Trivette, Chester D., Jr.; and Maender, Otto W., to Monsanto Company. Vulcanization of rubber with phosphoro triazine sulfides. 3,867,358, Cl. 260-79.50C.

Trocciola, John C.; Schroll, Craig R.; and Elmore, Dan E., to United Aircraft Corporation. Wet seal for liquid electrolyte fuel cells. 3,867,206, Cl. 136-86.00D.

Trogan, John F.; and Beebe, James H., to C. G. Bretting Manufacturing Co., Inc. Separator and transfer device for paper napkins, towels and the like. 3,866,905, Cl. 271-181.000.

Troller, Theodor H. High energy axial flow transfer stage. 3,867,062, Cl. 415-194.000.

TRW Inc.: *See—*
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Tsukamoto, Sakichi. Nail file. 3,866,618, Cl. 132-76.400.

Tucci, John James, to AMP Incorporated. Apparatus for connecting conductors to two connectors which are back to back. 3,866,292, Cl. 29-203.0MW.

Tucci, John James, to AMP Incorporated. Apparatus for connecting conductors to which are back to back. 3,866,295, Cl. 29-203.0MW.

Tucci, John James, to AMP Incorporated. Apparatus for connecting conductors to terminals in connectors intermediate the ends of the conductors. 3,866,296, Cl. 29-203.0MW.

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Uhl, Siegfried; and Schiele, August, to Keller & Knappich Augsburg Zweigneiderlassung der Industrie-Werke Karlsruhe Augsburg Aktiengessellschaft. Safety device for a tank turret weapon. 3,866,514, Cl. 89-36.00K.

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Umezawa, Hamao; Kondo, Shinichi; Aoyagi, Takaaki; Takeuchi, Tomio; and Maeda, Kenji, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for the synthesis of leupeptins and their analogues. 3,867,364, Cl. 260-112.500.

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Urban, Horst, to Norddeutsche Seekabelwerke Aktiengesellschaft. Sensor for submersible probes. 3,867,630, Cl. 250-239.000.
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Van Horn, Russell F.; Bok, Lowell D.; King, Albert C., Jr.; Suerdieck, Ronald R.; and Thrower, Arthur J., to B. F. Goodrich Company, The. Tire building machine. 3,867,230, Cl. 156-417.000.
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Webber, Robert C. Method and apparatus for controlling refrigerant flow in cryogenic systems. 3,866,430, Cl. 62-115.000.
Weber, Ernesto Juan. Control device. 3,866,521, Cl. 92-95.000.
Weber, Ronald A.; and Rains, John K., to Exxon Production Research Company. Detent diverter. 3,866,628, Cl. 137-625.440.
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Wilpers, Dale J., to Shell Oil Company. Method of quench hardening with oil comprising mono (polyisobutenyl) succinimide. 3,866,603, Cl. 148-29.000.
Wilson, Bertram A. Soffit lighting unit. 3,867,626, Cl. 240-73.00R.
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495 3,866,528

CLASS 100
43 3,866,529
53 3,866,530
88 3,866,531
171 3,866,532

CLASS 101
93.14 3,866,533
144 3,866,534

CLASS 102
70.2G 3,866,535
91 3,866,536

CLASS 104
99 3,866,537
167 3,866,538
249 3,866,539

CLASS 105
1A 3,866,540
368R 3,866,542
3,866,543
376 3,866,544
406 3,866,545
410 3,866,546

CLASS 106
38.27 3,867,155
40V 3,867,156
48 3,867,157
51 3,867,158
88 3,867,159
90 3,867,160
96 3,867,161
277 3,867,162
315 3,867,163

CLASS 108
38 3,866,547
79 3,866,548
153 3,866,549
3,866,550

CLASS 110
8R 3,866,551

CLASS 111
85 3,866,552

CLASS 112
258 3,866,553
262 3,866,554

CLASS 114
.5R 3,866,555
41 3,866,556
61 3,866,557
90 3,866,558
108 3,866,559
227 3,866,560
235B 3,866,561

CLASS 115
41R 3,866,562

CLASS 116
34R 3,866,563

CLASS 117
.5 3,867,164
3,867,165
23 3,867,166
34 3,867,167
36.1 3,867,168
36.2 3,867,169
37LE 3,867,170
38 3,867,171
3,867,172
39 3,867,173
47A 3,867,174
3,867,175
50 3,867,176
51 3,867,177
69 3,867,178
76FB 3,867,180
76F 3,867,179
80 3,867,181
95 3,867,182
107.2P 3,867,184
107.2R 3,867,183
118 3,867,185
136 3,867,186
138.8UA 3,867,189
138.8A 3,867,190
138.8E 3,867,187
138.8F 3,867,188
169R 3,867,191
201 3,867,192
212 3,867,193

CLASS 118
10 3,866,564
49.1 3,866,565

58 3,866,566
69 3,866,567
238 3,866,568
249 3,866,569
405 3,866,570
621 3,866,571
637 3,866,572
3,866,573
3,866,574
3,866,575

CLASS 119

18 3,866,576
19 3,866,577

CLASS 123

8.45 3,866,578
25A 3,866,579
41.7 3,866,580
51B 3,866,581
53A 3,866,582
97B 3,866,583
3,866,584
119A 3,866,585
3,866,586
122F 3,866,587
124R 3,866,588
148OR 3,866,590
148R 3,866,589
179K 3,866,591

CLASS 124

24R 3,866,592

CLASS 126

91A 3,866,593
112 3,866,594
121 3,866,595
208 3,866,596

CLASS 127

5 3,867,194
22 3,867,195

CLASS 128

1R 3,866,597
3,866,598
2L 3,866,599
2.1R 3,866,600
4 3,866,601
6 3,866,602
64 3,866,604
70 3,866,605
71 3,866,606
92R 3,866,607
276 3,866,608
303R 3,866,609
322 3,866,610
346 3,866,611
401 3,866,612
408 3,866,613
419D 3,866,615
419P 3,866,614
3,866,616
484 3,866,617

CLASS 132

76.4 3,866,618

CLASS 134

25R 3,867,197
29 3,867,198

CLASS 135

15PQ 3,866,619

CLASS 136

28 3,867,199
36 3,867,200
86D 3,867,206
114 3,867,201
232 3,867,205

CLASS 137

83 3,866,620
99 3,866,621
102 3,866,622
3,866,623
234.6 3,866,624
269 3,866,625
322 3,866,626
512.5 3,866,627
583 3,866,630
608 3,866,629
625.44 3,866,628

CLASS 138

125 3,866,631
130 3,866,632
3,866,633

CLASS 139

79 3,866,634

CLASS 141

45 3,866,635
59 3,866,636
226 3,866,637
352 3,866,638

CLASS 144

2Z 3,866,639
3R 3,866,640
32 3,866,641
212 3,866,642
241 3,866,643
288C 3,866,644
326C 3,866,645

CLASS 148

1.5 3,867,196
6.14R 3,867,207
11.5R 3,867,208
12.7 3,867,209
16 3,867,210
20.6 3,866,603
31.55 3,867,211
127 3,867,212
175 3,867,202
187 3,867,203
188 3,867,204

CLASS 149

19.2 3,867,213
100 3,867,214
3,867,215

CLASS 150

1.5 3,866,646
30 3,866,647
39 3,866,648
52R 3,866,649

CLASS 151

21C 3,866,650

CLASS 152

313 3,866,651
317 3,866,652
365 3,866,653

CLASS 156

2 3,867,216
3 3,867,217
8 3,867,218
17 3,866,398
72 3,867,219
73.6 3,867,220
77 3,867,221
107 3,867,222
123 3,867,223
182 3,867,224
209 3,867,225
229 3,867,226
249 3,867,227
405 3,867,228
415 3,867,231
417 3,867,229
3,867,230
502 3,867,232
571 3,867,233

CLASS 157

1.1 3,866,654
1.24 3,866,655

CLASS 159

4D 3,867,234

CLASS 160

84 3,866,656
181 3,866,657
206 3,866,658
349D 3,866,659

CLASS 161

2 3,867,235
24 3,867,237
37 3,867,238
3,867,239
41 3,867,240
42 3,867,241
57 3,867,242
65 3,867,243
88 3,867,247
3,867,248
116 3,867,249
133 3,867,244
143 3,867,245
145 3,867,236
271 3,867,250

CLASS 162

30 3,867,251
76 3,867,246
268 3,867,252

CLASS 164

108 3,866,660
114 3,866,661
123 3,866,662
155 3,866,663
281 3,866,665
283M 3,866,664
327 3,866,666
334 3,866,667

CLASS 165

1 3,866,668
27 3,866,669
47 3,866,670
50 3,866,671
3,866,672
120 3,866,673
166 3,866,674
173 3,866,675

CLASS 166

.5 3,866,676
.6 3,866,677
66 3,866,678
77 3,866,679
273 3,866,680
285 3,866,681
3,866,682
292 3,866,683
294 3,866,684
3,866,685

CLASS 169

39 3,866,686
61 3,866,687

CLASS 172

311 3,866,688
3,866,689

CLASS 173

15 3,866,690
48 3,866,692
49 3,866,693
73 3,866,746
75 3,866,694

CLASS 174

36 3,867,564
120SC 3,867,565
146 3,867,566

CLASS 175

5 3,866,696
3,866,697
53 3,866,698
228 3,866,695

CLASS 176

40 3,867,253
87 3,867,254

CLASS 177

34 3,866,699

CLASS 178

3 3,867,567
5.8AF 3,867,568
7.1 3,867,569
7.2 3,867,570
7.6 3,867,571
3,867,572
17.5 3,867,573
67 3,867,574
69.5TV 3,867,575

CLASS 179

1A 3,867,576
2R 3,867,577
6E 3,867,578
15A 3,867,579
16EA 3,867,580
18BD 3,867,581
18BE 3,867,582
18E 3,867,583
84C 3,867,584
84T 3,867,585
115.5H 3,867,586
115.5R 3,867,587
175.3R 3,867,588
175.31R 3,867,589

CLASS 180

6.48 3,866,700
14C 3,866,701
65R 3,866,702
3,866,703
68.5 3,866,704
79.2B 3,866,705
79.2R 3,866,706
127 3,866,707

CLASS 181

33R 3,866,708
114 3,866,709
159 3,866,710
176 3,866,711
178 3,866,712

CLASS 182

2 3,866,713
22 3,866,714
45 3,866,715

CLASS 184

14 3,866,716

CLASS 187

19 3,866,717
27 3,866,718

CLASS 188

3R 3,866,719
67 3,866,720
72.6 3,866,721
75 3,866,722
109 3,866,723
129 3,866,724
134 3,866,725

CLASS 191

12R 3,867,590

CLASS 192

6R 3,866,726
13R 3,866,727
56R 3,866,728
84C 3,866,729
104C 3,866,731
111A 3,866,733

CLASS 193

25B 3,866,734

CLASS 195

5 3,867,255
11 3,867,256
81 3,867,257
99 3,867,258
3,867,259

CLASS 197

55 3,866,735
181 3,866,736

CLASS 198

22R 3,866,737
27 3,866,738
30 3,866,739
34 3,866,740
35 3,866,741
175 3,866,742
195 3,866,743
278 3,866,744

CLASS 200

52R 3,867,591
61.18 3,867,592
61.41 3,867,593
83P 3,867,594
86R 3,867,595
150R 3,867,597
153G 3,867,598
153J 3,867,596
153K 3,867,599
157 3,867,600
158 3,867,601
163 3,867,602
239 3,867,603
329 3,867,604

CLASS 202

185E 3,867,260
263 3,867,261

CLASS 203

41 3,867,262
81 3,867,263

CLASS 204

4 3,867,264
28 3,867,265
39 3,867,266
51 3,867,267
119 3,867,268
158S 3,867,269
159.018 3,867,270
180G 3,867,271
194 3,867,272
195R 3,867,273
197 3,867,274

CLASS 206

45.14 3,866,745
94 3,866,747
111 3,866,748
234 3,866,749
290 3,866,750
387 3,866,751

CLASS 208

8 3,867,275
60 3,867,276
111 3,867,277
3,867,278
114 3,867,279
120 Re.28,341
139 3,867,280
213 3,867,281
216 3,867,282

CLASS 209

12 3,866,752
73 3,866,753
3,866,754
74M 3,867,283
80.5 3,866,755

CLASS 210

15 3,867,284
32 3,867,285
58 3,867,286
59 3,867,287
60 3,867,288
95 3,867,289
138 3,867,290
139 3,867,291
169 3,867,292
252 3,867,293
489 3,867,294

CLASS 211

69.5 3,866,756
3,866,992
105.1 3,866,757
107 3,866,758

CLASS 212

8R 3,866,759
144 3,866,760

CLASS 214

1QG 3,866,762
1P 3,866,761
6BA 3,866,763
8.5SS 3,866,765
8.5D 3,866,764
16.1E 3,866,766
16.4B 3,866,767
38B 3,866,768
44A 3,866,769
83.2 3,866,770
85 3,866,771
85.1 3,866,772
152 3,866,773
3,866,774
340 3,866,775
450 3,866,776
454 3,866,777
508 3,866,778
621 3,866,779
655 3,866,780
778 3,866,781

CLASS 215

253 3,866,782
254 3,866,783
321 3,866,784
341 3,866,845

CLASS 219

10.55 3,867,605
3,867,606
3,867,607
73 3,867,608
137 3,866,284
150V 3,867,609
286 3,867,610
523 3,867,611

CLASS 220

9D 3,866,785
10 3,866,786
19 3,866,787
3,866,788
31S 3,866,793
44R 3,866,789
67 3,866,790
72 3,866,792
95 3,866,791
320 3,866,794
358 Re.28,342

CLASS 221

150HC 3,866,795
152 3,866,796
263 3,866,797

CLASS 222

52 3,866,798
63 3,866,799
94 3,866,800
146C 3,866,801
153 3,866,802
170.5 3,866,803
396 3,866,804
427 3,866,805
504 3,866,806

CLASS 223

68 3,866,807
73 3,866,808
88 3,866,809
98 3,866,810

CLASS 224

2B 3,866,811

CLASS 226

50 3,866,812

CLASS 229

8 3,866,814
3,866,815
14B 3,866,816
15 3,866,817
30 3,866,818
3,866,819
43 3,866,820
52B 3,866,821
69 3,866,822

CLASS 232

35 3,866,823
43.2 3,866,824

CLASS 233

1B 3,866,825

CLASS 235

54A 3,866,826
61.11D 3,866,827
61.7R 3,867,612
92PC 3,867,613
92TC 3,867,615
92T 3,867,614
98R 3,866,828
151.1 3,867,616
151.3 3,866,829
151.32 3,867,617
153AC 3,867,618
156 3,867,619
181 3,867,620

CLASS 238

8 3,866,830

CLASS 239

4 3,866,831
18 3,866,832
76 3,866,833
167 3,866,834
177 3,866,835
3,866,836
261 3,866,837
372 3,866,838
416.5 3,866,839

CLASS 240

2P 3,867,622
2R 3,867,621
2.1 3,867,623
2.14 3,867,624
7.1R 3,866,840
13 3,867,625
73R 3,867,626

CLASS 241

46.11 3,866,841
47 3,866,842
55 3,866,843
282.2 3,866,844

CLASS 242

7.06 3,866,846
7.09 3,866,847
35.6E 3,866,848
47 3,866,849
65 3,866,853
68.4 3,866,850
75.43 3,866,851
82 3,866,852
107.4 3,866,854
184 3,866,855
188 3,866,856

CLASS 244

17.25 3,866,857
32 3,866,858
77R 3,866,859
103S 3,866,860
118P 3,866,861
152 3,866,862
162 3,866,863

CLASS 248

1 3,866,864
2 3,866,865
16 3,866,866
23 3,866,867
27 3,866,868
51 3,866,869
56 3,866,870
59 3,866,871
97 3,866,872
205A 3,866,873
251 3,866,874
359 3,866,877
363 3,866,875
429 3,866,876
500 3,866,878

CLASS 250

199 3,867,627
206 3,867,628
225 3,867,629
239 3,867,630
281 3,867,631
292 3,867,632
334 3,867,633
360 3,867,634
396 3,867,635
445 3,867,636
503 3,867,637
505 3,867,638
550 3,867,639
573 3,867,640

CLASS 251

145 3,866,879
297 3,866,880

CLASS 252

33.4 3,867,295
3,867,296
47.5 3,867,297
49.8 3,867,298
62.54 3,867,299
106 3,867,300
108 3,867,301
301.2R 3,867,302
301.6P 3,867,303
313S 3,867,304
437 3,867,305
452 3,867,306
455R 3,867,309
455Z 3,867,307
3,867,308
3,867,310
460 3,867,311
462 3,867,312
465 3,867,313
466PT 3,867,314
512 3,867,315
545 3,867,316
555 3,867,317

CLASS 254

1 3,866,881
29R 3,866,882
93R 3,866,883

CLASS 256

59 3,866,884

CLASS 259

3 3,866,885
4 3,866,886
154 3,866,887

158 3,866,888
161 3,866,889
191 3,866,890

CLASS 260

2A 3,867,318
2.5AJ 3,867,320
2.5R 3,867,319
17.4ST 3,867,321
18S 3,867,322
19R 3,867,323
23XA 3,867,325
23H 3,867,324
27BB 3,867,327
29.3 3,867,328
29.6NR 3,867,330
29.6H 3,867,329
31.8R 3,867,331
37N 3,867,326
40P 3,867,332
42.32 3,867,333
3,867,334
42.52 3,867,335
45.7R 3,867,336
3,867,339
45.75N 3,867,340
45.75R 3,867,341
45.8NT 3,867,337
45.85S 3,867,342
45.9P 3,867,338
46.5UA 3,867,343
47EN 3,867,344
59EP 3,867,346
63UY 3,867,347
70R 3,867,348
75M 3,867,349
77.5AM 3,867,350
77.5CR 3,867,351
77.5R 3,867,352
78.3R 3,867,353
78.4EP 3,867,354
79.1 3,867,356
3,867,357
79.3R 3,867,355
79.5C 3,867,358
3,867,359
79.7 3,867,360
88.2 3,867,361
91.7 3,867,362
112R 3,867,363
112.5 3,867,364
3,867,365
121 3,867,366
125 3,867,367
165 3,867,369
239BD 3,867,370
239.1 3,867,371
239.3D 3,867,372
239.3R 3,867,373
239.3T 3,867,374
240B 3,867,376
240R 3,867,375
3,867,377
243C 3,867,378
3,867,379
3,867,380
247.7R 3,867,381
248C 3,867,382
249.6 3,867,383
256.4C 3,867,385
256.4F 3,867,386
256.4Q 3,867,384
3,867,387
268BC 3,867,388
268R 3,867,389
293.73 3,867,390
3,867,391
294.8R 3,867,392
294.9 3,867,393
296T 3,867,394
308R 3,867,395
3,867,396
3,867,397
3,867,398
309.2 3,867,399
309.5 3,867,400
309.6 3,867,401
310R 3,867,402
311 3,867,403
325PH 3,867,404
326D 3,867,406
326.5FL 3,867,405
335 3,867,407
340.9 3,867,408
346.2M 3,867,409
346.4 3,867,410
346.8A 3,867,411
3,867,412
397.1 3,867,413
404.5 3,867,414
408 3,867,415
412.8 3,867,416
429K 3,867,417
429.2 3,867,418
439R 3,867,419
448.8R 3,867,420
457 3,867,421
465.8R 3,867,422
468D 3,867,423
471C 3,867,424
3,867,425
472 3,867,426
473S 3,867,427
479C 3,867,428
3,867,429
488CD 3,867,430
501.11 3,867,431
503 3,867,432
515A 3,867,433
3,867,434
3,867,435
518R 3,867,436
3,867,437
525 3,867,439
530N 3,867,345
3,867,438
535R 3,867,440
551S 3,867,441
555A 3,867,442
561HL 3,867,444
561A 3,867,445
561R 3,867,443
562B 3,867,446
564G 3,867,447
564R 3,867,448
566B 3,867,449
3,867,450
569 3,867,451
3,867,452
570AB 3,867,453
570.5P 3,867,454
570.6 3,867,455
574 3,867,456
590 3,867,457
600 3,867,458
601 3,867,459
606.5B 3,867,460
610A 3,867,461
611.5 3,867,462
618H 3,867,463
618R 3,867,464
3,867,465
621R 3,867,466
622R 3,867,467
650R 3,867,468
659A 3,867,469
674SA 3,867,470
680R 3,867,471
3,867,472
683.45 3,867,473
683.48 3,867,474
683.63 3,867,475
683.68 3,867,476
837R 3,867,477
857PG 3,867,478
860 3,867,479
873 3,867,480
899 3,867,481
924 3,867,482
954 3,867,483
961 3,867,484

CLASS 261

7 3,867,485
29 3,867,486
41D 3,867,487
87 3,867,488

CLASS 264

.5 3,867,489
21 Re.28,340
24 3,867,490
29 3,867,491
45.3 3,867,494
45.9 3,867,493
46.6 3,867,492
51 3,867,495
71 3,867,496
81 3,867,497
88 3,867,498
182 3,867,499
216 3,867,500
219 3,867,501
263 3,867,502
313 3,867,503
326 3,867,504

CLASS 266

5E 3,866,891
23K 3,866,892
33S 3,866,893

CLASS 267

31 3,866,894
61S 3,866,896
65D 3,866,895

CLASS 269

87.2 3,866,897
138 3,866,898
322 3,866,899

CLASS 270

5 3,866,900

CLASS 271

21 3,866,901
64 3,866,902
119 3,866,903
173 3,866,904
181 3,866,905
227 3,866,906

CLASS 272

8R 3,866,907
73 3,866,908
76 3,866,909
80 3,866,910

CLASS 273

1R 3,866,911
29A 3,866,912
30 3,866,913
44 3,866,691
55R 3,866,914
85R 3,866,915
105.2 3,866,916
120R 3,866,917
135AC 3,866,918
3,866,919
138A 3,866,920
138R 3,866,921
164 3,866,922

CLASS 277

9 3,866,813
24 3,866,923
59 3,866,924
164 3,866,925
166 3,866,926

CLASS 280

11.12 3,866,927
11.35K 3,866,928
11.35T 3,866,929
3,866,930
11.37B 3,866,931
12R 3,866,932
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33 : 3,866,318
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35 : 3,866,496
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46	:	3,867,237		3,866,529		3,866,826		3,867,714		3,866,780	3,866,640
47	:	3,866,655		3,866,543		3,866,840		3,867,724		3,866,851	3,866,675
		3,867,049		3,866,544		3,866,850	49 :	3,866,608		3,867,244	3,866,724
		3,867,137		3,866,577		3,866,901	51 :	3,866,363		3,867,651	3,866,738
		3,867,176		3,866,610		3,866,923		3,866,561		3,867,663	3,866,861
		3,867,408		3,866,621		3,866,924		3,866,752		3,867,688	3,866,892
		3,867,588		3,866,677		3,866,935		3,867,339		3,867,712	3,866,905
		3,867,705		3,866,678		3,866,954		3,867,642	54 :	3,866,417	3,867,166
48	:	3,866,322		3,866,679		3,866,972		3,867,681		3,866,571	3,867,173
		3,866,331		3,866,682		3,866,988	53 :	3,866,325		3,867,335	3,867,179
		3,866,341		3,866,684		3,866,994		3,866,343		3,867,505	3,867,225
		3,866,356		3,866,685		3,867,039		3,866,400		3,867,515	3,867,365
		3,866,398		3,866,690		3,867,111		3,866,541	55 :	3,866,336	3,867,388
		3,866,468		3,866,698		3,867,113		3,866,547		3,866,471	3,867,578
		3,866,478		3,866,709		3,867,128		3,866,599		3,866,576	3,867,641
		3,866,480		3,866,746		3,867,633		3,866,607		3,866,629	3,867,678
						3,867,713		3,866,719		3,866,631	56 : 3,866,933

DESIGN PATENTS

4	:	234,354		234,374		234,342		234,337		234,371	42 : 234,352
5	:	234,367		234,375		234,343	25 :	234,365		234,373	44 : 234,363
6	:	234,329	8 :	234,356		234,344	34 :	234,335	37 :	234,345	55 : 234,338
		234,330		234,357		234,350		234,347		234,351	234,362
		234,331		234,359	12 :	234,349		234,360		234,353	234,376
		234,355	9 :	234,340		234,372	36 :	234,339	39 :	234,364	234,377
		234,358		234,341	17 :	234,336		234,365			

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*